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ABSTRACT

Indicators in this volume provide international benchmarks for assessing the condition of education in U.S. states and in the United States as a whole by comparison with many other industrialized countries for which data are available. On six sets of indicators (37 indicators in all), country-level and state-level measures are arrayed side-by-side to facilitate comparison. The indicators are grouped into six categories: (1) background; (2) participation; (3) processes and institutions; (4) achievement and attainment; (5) labor market outcomes; and (6) finance. The presentation of each indicator includes an explanation of what it measures, why it is important, and key results from a comparison of countries and states. Throughout the report, comparisons are most often made in the text among like-sized entities. The presentation of each indicator also includes separate tables for states and countries and graphs that display states and countries together. Supplemental notes and a statistical appendix include supplemental and technical information on how measures in the indicators were calculated, and a glossary is included. (Contains 37 two-part tables and 37 figures, some of which have several parts.) (SLD)

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Indicators Comparing U.S. States with Other Industrialized Countries in 1991

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Education in States and Nations:

Indicators Comparing U.S. States with Other Industrialized Countries in 1991

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The Cover:

The countries shaded on the world map are those included in the two sources providing most of the international data used in this report — ***Education at a Glance***, of the Organization for Economic Co-operation and Development (OECD), and ***Learning Mathematics***, of the International Assessment of Educational Progress (IAEP).

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FOREWORD

Today's shrinking world brings us closer to other nations through improved communications, transportation, and an increasingly global marketplace. Many Americans now agree that our nation's ability to compete in the world economy depends vitally on continuous improvements not only at the workplace, but in our education system as well.

Education in States and Nations reflects two realities — increasing globalization and the centrality of the states in American education. In ***Education in States and Nations***, indicators provide international benchmarks for assessing the condition of education in the U.S. states and in the United States as a whole by comparison with many other industrialized countries for which data are available. On six sets of education indicators — background, participation, processes and institutions, achievement and attainment, labor market outcomes, and finance — country-level and state-level measures are arrayed side-by-side in order to facilitate that comparison.

The country-level data come from a variety of sources, but two sources are most prominent: the second edition of international education indicators, ***Education at a Glance***, of the Organization for Economic Co-operation and Development (OECD); and the International Assessment of Educational Progress, which administered a mathematics test to 13-year-olds in about 20 countries and surveyed them and their school administrators about various aspects of the education process. The indicators in ***Education in States and Nations*** correspond to as many of the international indicators for which state-level data were both applicable and available.

This report is the second effort of its kind; the first edition, produced in 1993, was based on state and country data from the late 1980s. This edition, using data primarily from the early 1990s, is much larger than its predecessor. This reflects both a greater availability of suitable international indicators and state-level data, as well as a greater effort to find relevant indicators, both domestic and international.

Like its predecessor, this edition of ***Education in States and Nations*** may provoke discussions over what it includes, what it does not include, and how the data are presented. Thus, this report may raise some questions even as it answers others. That, however, should not diminish its usefulness. On the contrary, it will be beneficial if ***Education in States and Nations*** sparks a desire in readers to better understand the education systems of other countries or to improve on this set of indicators in future publications. This publication represents another step in an evolving process, not the conclusion of a limited study. As such, NCES would welcome comments or suggestions for future editions.

Jeanne E. Griffith, Acting Commissioner
National Center for Education Statistics

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Others at the Pelavin Research Institute making important contributions included: **Bing Deng**, **Laura O'Neal**, **Sonya Gross**, **Jon Cohen**, **B.J. Horgeshimer**, **Clayton Best**, **Andrew Cullen**, **Eric Grodsky**, **David Nohara**, **Dee White**, **Amy O'Malley**, **Art Mitchell**, **Nancy Matheson**, **Anne Anderson**, **Ray Varisco**, **Brandon Pennix**, and **Eve Jones**.

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NOTE ON INTERNATIONAL COMPARISONS MADE IN THIS REPORT

One intention behind the design of this report was to make comparisons among "like-sized" entities. Thus, whenever possible, the United States is compared to other countries with large economies, such as those of the G-7, and the U.S. states are compared to countries with both large and small economies, such as those of the OECD or those that participated in the IAEP. Each of these country groupings is described below. The careful reader might also appreciate the clarification of the status of Germany as used in this report, also provided below, since data are used from both before and after that country's reunification.

The Group of Seven (G-7): This group is composed of seven nations with large economies, the seven largest economies in the world at the time of the group's formation. Officials of each country meet periodically to discuss mutually beneficial agreements, most conspicuously in "G-7 Economic Summits." The member countries are: Canada, France, Germany, Italy, Japan, the United States, and the United Kingdom.

The Organization for Economic Co-operation and Development (OECD): The OECD is an organization of 24 nations whose purpose is to promote trade and economic growth in both member and non-member nations. OECD's activities cover almost all aspects of economic and social policy. The member countries in 1991 were: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. Greece and Iceland did not participate in the data compilation used for this report, whereas Czechoslovakia and Hungary, which had applied for membership in the OECD at the time of the data compilation, did participate.

The International Assessment of Educational Progress (IAEP): In 1990-91, as part of an international effort coordinated by the Educational Testing Service (ETS), 20 countries assessed the mathematics and science achievement of their 13-year-old students. In addition, the students spent about 10 minutes responding to questions about their backgrounds and home and school experiences. School administrators completed a school questionnaire. The participating countries included: Brazil (the cities of São Paolo and Fortaleza), Canada, China, England, France, Hungary, Ireland, Israel, Italy (the province of Emilia Romagna), Jordan, Korea, Portugal, Scotland, the Soviet Union, Slovenia, Spain, Switzerland, Taiwan, and the United States.

Germany: In 1990, the former German Democratic Republic (East Germany) acceded to the Federal Republic of Germany. Some indicators presented in this report use data that predate the reunification and use the country names "Germany (West)" or "Germany (East)." Indicators with data from the entire reunified country use the country name "Germany." Still other indicators use data from the period after reunification but prior to the combination of the relevant education statistics of the two former, separate countries. These indicators also use the country name "Germany (West)" to indicate that the data refer only to the former territory of the Federal Republic, that is, West Germany.

Other international organizations whose data are also used in this report include: Asia Pacific Economic Cooperation (APEC), the European Community (EC), the Luxembourg Income Study (LIS), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and the World Health Organization (WHO). International data collections of the American Federation of Teachers, the National Science Foundation, and the Census Bureau are also used in this report.

INTRODUCTION AND OVERVIEW

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INTRODUCTION AND OVERVIEW

In 1983, when ***A Nation at Risk*** highlighted both the state of American education and its essential role in our nation's prosperity, the report's first piece of evidence was international comparisons of mathematics and science achievement. It appeared then that U.S. students were being outperformed by students in other countries, including some countries that educate their students at lower cost. This report from an independent commission appointed by the Secretary of Education suggested that, at a time when a nation's power and prosperity were more than ever before determined by the collective brain power of its citizenry, the U.S. education system seemed not to be performing as well as it could.[1,2]

A few years later, in 1986, the National Governors' Association issued ***A Time for Results***, a report similar to ***A Nation at Risk*** in tone, in the nature of its evidence, and in its recommendations. ***A Time for Results*** asserted even more strongly than ***A Nation at Risk*** that global economic competition meant that the most appropriate benchmarks for education system performance were now global as well. This report by a *national* association of *state* governors was at once an assertion that education was a national concern, and that it was still primarily a state and local responsibility.[3]

Since publication of ***A Time for Results***, Americans have seen much activity on education policy at the interstices of authority between the separate branches and levels of government. The Federal government and the nation's governors joined their efforts formally at the Charlottesville, Virginia "education summit" in 1989; and the subsequently-formed National Education Goals Panel and National Council on Education Standards and Testing both included members from the Congress, the White House, the U.S. Department of Education, and the ranks of governors and state legislators. Agreement on six National Education Goals followed the Charlottesville summit. In 1994, Congress added two additional goals related to parental involvement and teacher professional development.

A commitment to reaching world-class education performance levels is explicitly expressed in National Education Goals 5 and 6. Goal 5 declares that U.S. students will be first in the world in science and mathematics achievement by the year 2000. Goal 6 asserts that every adult American will possess the knowledge and skills necessary to compete in a global economy.[4]

By joining efforts with the Federal government, the governors did not intend to share the management of the public schools. However, they did agree that the Federal government had an important role to play in the collection and dissemination of comparative data needed to manage the quality of American education.

In 1988, the U.S. Congress authorized the establishment of a Special Study Panel on Education Indicators for the U.S. Department of Education's National Center for Education Statistics (NCES). This panel was chartered in July 1989 and directed to prepare a report, published in 1991, ***Education Counts: An Indicator System to Monitor the Nation's Educational Health.*** The Panel's report recommended a variety of ways in which NCES should increase its collection and presentation of indicator data. Among the many recommendations, the report urged NCES to: strengthen its national role in data collection and provide technical assistance to the states; improve its capacity to collect international data; and develop a "mixed model" of indicators — international and national indicators, state and local indicators, and a subset of indicators held in common.

Two of NCES's primary indicators projects include ***The Condition of Education*** and the National Assessment of Educational Progress (NAEP).[5] The ***Condition*** is an annual compendium of statistical information on American education, including trends over time, international country comparisons, and some comparisons among various groups (by sex, ethnicity, socioeconomic status, and others). However, the ***Condition*** contains very few state-by-state comparisons.

The National Assessment of Educational Progress (NAEP) is a congressionally-mandated assessment of the academic achievement of American students. Begun in the late 1960s, NAEP has been reporting assessment results state-by-state, on a trial basis, only since 1990. In that year, 37 states, the District of Columbia, and 2 territories participated in a Trial State Assessment program in eighth-grade mathematics. In the 1992 Trial State Assessments in 4th-grade reading and mathematics and 8th-grade mathematics, voluntary participation increased to 41 states, the District of Columbia, and 2 territories. The same number of jurisdictions participated in the 1994 Trial State Assessment of fourth grade reading.

At the same time that U.S. officials began looking outside our borders for education policy lessons and performance benchmarks, officials in other countries were doing likewise. The Organization for Economic Cooperation and Development (OECD), which had for years published indicators on macroeconomics, trade, industry, and agriculture, began an effort in the 1980s to develop and collect social indicators, starting with health care. Turning its attention next to education, the organization launched, in 1987, the Indicators of Education Systems project (INES) in its Center for Educational Research and Innovation (CERI).[6] CERI organized several international groups of experts to develop conceptual frameworks, to agree on definitions, and to execute pilot studies to determine the set of possible indicators that best illustrated the condition of education in the OECD countries. In 1992, the OECD published a set of indicators, employing data from the late 1980s, in ***Education at a Glance***.[7] An updated second edition, ***Education at a Glance (Edition 1993)***, was published in December 1993, and a third edition was released in January 1995.[8]

The first edition of ***Education in States and Nations: Indicators Comparing U.S. States with the OECD Countries in 1988***, produced in 1993, served as a logical next step and a U.S. companion volume to ***Education at a Glance***, incorporating U.S. state-level data from the late 1980s. It not only allowed state-to-state and country-to-country comparisons, but state-to-country comparisons as well. For perhaps the first time, states could compare their support for education, the participation of their youth in the education system, or their educational outcomes with those of a number of industrialized countries, including some quite similar in size or wealth. In other words, on a variety of measures, education in U.S. states could now be compared internationally.

Why compare states to nations? In many countries, public responsibility for education is vested in the national government, in an education ministry.[9] In the United States, however, public responsibility for education rests primarily at the state level.[3] In 1992, state-level governments provided 46 percent of revenues for public elementary and secondary schools. This share of contribution ranged from 8 percent in New Hampshire to 90 percent in Hawaii. In many cases, the most valid American counterparts to other countries' national ministries of education are our state education departments.

This edition, ***Education in States and Nations: Indicators Comparing U.S. States with Other Industrialized Countries in 1991***, is much larger than its predecessor. This reflects both a greater availability of suitable international indicators and a greater effort to find relevant indicators, both domestic and international. The large size of this volume was not a goal in itself, but is coincident to others. ***Education in States and Nations/1991*** has two goals:

1) To improve the quality of indicators, where possible, with better data; and
2) To expand the domain of indicators to encompass more topics pertinent to education policy.

With the addition of more topics and more and better sources of data, this second edition of ***Education in States and Nations*** offers more depth and breadth than did its predecessor.

The Content of *Education in States and Nations/1991*

Education in States and Nations/1991 includes 37 indicators. They were chosen to take advantage of the data available in ***Education at a Glance (Edition 1993)***, from the International Assessment of Educational Progress (IAEP), and from several other contemporary sources of international education indicators. International indicators were selected for use in ***Education in States and Nations/1991*** if they were relevant to states and if comparable state-level data on the indicators existed. The indicators are grouped into six categories:

1) Background;
2) Participation;
3) Processes and Institutions;
4) Achievement and Attainment;
5) Labor Market Outcomes; and
6) Finance.

Indicators were selected in an attempt to cover the domain of the educational enterprise. The background and finance indicators could be described as "stocks" or "input" measures. Both of these groups of indicators are richly represented, with background indicators relating to geographic, demographic, economic, and sociological factors, and with finance indicators presenting revenues and expenditures viewed several different ways. Similarly, the indicators for participation and for processes and institutions could be described as "flows" or "throughput" measures, which represent aspects of the size, character, and practices of the formal education system. Finally, the indicators for achievement and attainment and for labor market outcomes present the "product" or "output" of education systems, as measured by degree completion, educational attainment, and economic benefits.

The data come from a variety of sources. The data on countries come from the Indicators of Education Systems (INES) project of the OECD, the International Assessment of Educational Progress (IAEP), the National Science Board, the Luxembourg Income Study, Asia Pacific Economic Cooperation, the European Community, the World Health Organization, UNESCO, the American Federation of Teachers, and several other sources. The data on individual states come from NCES, the Department of Labor's Bureau of Labor Statistics, the Department of Commerce's Bureau of the Census, the Department of Health and Human Services' National Center for Health Statistics, the National Science Board, the American Federation of Teachers, the Center for the Study of Social Policy, and Child Trends, Inc. All these sources are described in more detail in the "Sources of Data" section in the back of the report. In addition, results from the 1992 NAEP study of mathematics achievement of American 8th-graders have been statistically linked to results from a similar 1991 study of the mathematics achievement of 13-year-old students in various countries. This linkage allows comparisons of academic achievement between states and countries.

The presentation of each indicator includes an explanation of what it measures, why it is important, and key results from a comparison of countries and states. Throughout the report, comparisons are most often made in the text among "like-sized" entities: the United States to the other large and relatively wealthy countries that compose the so-called Group of Seven, or G-7 (Canada, France, Germany, Italy, Japan, and the United Kingdom); and U.S. states to all industrialized countries for which data are available, including the smaller and relatively less wealthy ones.

It should be kept in mind, however, that these comparisons are based on the data available. Not all countries are represented here. Some countries are not members of the international organizations which collected the data. Other countries are members, but did not participate in the relevant data collections. Some countries participated in the OECD's data collection but not the IAEP's, and vice versa. If there is any systematic bias in such "data driven" international comparisons, it is probably toward the inclusion of countries with a well-developed public data collection and management capability and the exclusion of countries without.

In addition to the explanations and key results, the presentation of each indicator includes separate tables for states and countries and a graph or set of graphs that display states and countries together. The graphs are, in most cases, simple bar graphs with the states and countries listed in order of highest value to lowest. This type of graph highlights the distributional aspects of the data — where countries and states stand in relation to one another and the magnitude of the differences between them. Where appropriate, notes on interpretation describe special circumstances affecting an indicator that warrant particular consideration in making comparisons. Data sources are listed at the bottom of each table and graph. Because some of the terms used in this report may not be familiar to all readers, a glossary is included in the back. Finally, appendices include supplemental and technical information on how various measures in the indicators were calculated.

In the remainder of the overview, we highlight some of the more important concepts and results from each of the six sections of the report.

Section 1: Background

Understanding the context in which education systems exist is important to proper interpretation of indicators. Each indicator in this report, while measuring one particular aspect of education, is affected by a host of other factors, some not directly connected to education. The first group of indicators in this report represent some of these other factors that make up the context in which education takes place. Indicators in this group are:

(1) Population and area;

(2) Youth and population;

(3) Labor force participation;

(4) GDP/GSP per capita;

(5) Percentage of population age 17 or younger in poverty;

(6) Births to teen mothers; and

(7) Youth violent death rate.

A complete comparative understanding of education would require a consideration of still more factors not represented here, such as: differences in the levels of development of education systems, national and state education priorities and strategies, and cultural differences. Nonetheless, the seven indicators presented in the "Background" section provide some understanding of the environments in which education programs are set and should be considered when evaluating data in the categories of participation, processes and institutions, achievement and attainment, labor market outcomes, and finance.

How closely do the states resemble other industrialized nations demographically and economically?

In general, the industrialized nations selected in this publication had higher population densities than the U.S. states. However, the U.S states tended to be wealthier, to have higher labor force participation rates, and to have greater proportions of youth (i.e., persons 5- to 29-years-old) in the overall population. For every indicator, one can find individual states closely resembling certain industrialized countries. For example:

- Pennsylvania had a population just slightly larger than that of Hungary (*Indicator 1*), and had the same percentage of 5- to 29-year-olds in its population. (*Indicator 2*)
- Texas, North Dakota, New Zealand, and Italy had similar labor force participation rates. (*Indicator 3*)
- The gross product per capita in South Dakota was only marginally greater than that in Japan. (*Indicator 4*)

How closely do the states resemble other industrialized nations sociologically?

Thirty-eight of the U.S. states had higher percentages of children living in poverty than all 17 of the other countries to which they are compared. Births to teen mothers generally constituted a higher percentage of all births in the states than in many of the industrialized nations, but the range of rates in those nations was the same as that of the states. For the most part, a greater percentage of youth died violently from accidents, suicides, and homicides in the states than in the nations. As with the demographic and economic background indicators, a comparison can be found between individual states and nations for each sociological indicator included. For example:

- With the exception of New Hampshire and Connecticut, the child poverty rate was higher in the states than in Italy, France the former West Germany, the Netherlands, Sweden, the United Kingdom, and several other countries — in some cases several times higher. (*Indicator 5*)

The poverty threshold used is an approximation of the U.S. average — 40 percent of median household income — and other countries' data are adapted to it. These poverty rates are measured after taxes and transfers; that is, they account for the effect of taxes and of governmental aid programs to the poor. These data for nations come from the Luxembourg Income Study's collection of national household surveys.

- The proportion of all births that were to 15- to 19-year-old mothers was similar in Alabama and Greece, 7.1 per 100 births. In 30 states, fewer than 6 out of every 100 births was to a teen mother, compared with 9 of the 12 European countries for which data are available. (*Indicator 6*)

- While only 3 of the 30 countries for which we have data had violent death rates among youth higher than 500 per million, 19 of the U.S. states did. The rates of suicide and accidental death among youths aged 5 to 24 in Austria were almost identical to those of Wisconsin; the rates of homicide within the same age group were slightly higher in Argentina and slightly lower in the Soviet Union than they were in Oregon, Kansas, or Kentucky. (*Indicator 7*)

In summary, economic, demographic, and sociological characteristics of the U.S. states were similar in many cases to those of other industrialized countries. While these similarities between nations and states could almost always be found, some overarching trends differentiating states and nations are apparent. For example, the states tended to have lower population densities, greater wealth, and higher labor force participation rates than the other industrialized countries. Youths aged 5 to 29 typically composed a larger portion of the population in states than they did in other countries. This high proportion of young citizens in the states seemed to confront a relatively more negative social environment as well, manifested in higher rates of violent death among youth, of births to teen mothers, and of child poverty.

Section 2: Participation

Participation in formal education is influenced not only by demand — the number of persons who can and wish to attend school — but also by the supply — the number of places available. In terms of supply, preprimary (which includes both kindergarten and pre-kindergarten programs) and postcompulsory education are more available in some states and countries than in others. High participation can reflect a large public or private investment in education, a high valuation of education by society, or an economy dependent on a highly trained workforce. Measures of the degree to which young people participate in their state or country's education system are included in this section. Indicators in this group are:

(8) Participation in formal education;
(9) Enrollment in preprimary education;
(10) Secondary education enrollment;
(11) Entry ratio to higher education;
(12) Non-university higher education enrollment; and
(13) University enrollment.

(International comparisons based on levels of education can sometimes cause confusion because the levels do not always have the same entrance requirements or the same duration across countries. To aid in understanding such comparisons, an explanatory note is included in the supplemental notes on page 231.)

How does participation in education change as people move from childhood to adulthood?

Two different measures of enrollment are used in this section: enrollment rates and enrollment ratios. Enrollment *rates* represent the percentage of students in a certain age group enrolled in a particular level of education. Enrollment *ratios* reflect the number of students of any age enrolled in a particular level of education per 100 persons in a reference age group, the ages typical of those enrolled at that level. Although enrollment rates are preferred to enrollment ratios, as they are not inflated by enrollments either outside the typical age of enrollment or by periods of enrollment longer than the typical duration, the requisite data needed to calculate enrollment rates — enrollment by age — are often unavailable.

- For most countries and states, the ratio of persons enrolled in formal education (total enrollment divided by the population in the 5-29 age range) was between 50 and 60 (*Indicator 8*).
- Of the states, Nevada had the smallest ratio of persons enrolled in formal education, with a ratio of 52, which was higher than in 9 of the 22 other countries for which data are available. (*Indicator 8*)

Preprimary participation rates are affected by the relative value placed on early socialization of children in society, the availability of low-cost or public preprimary programs, and the degree of participation of women in the labor market. Enrollment rates in preprimary education at ages 3 and 6 varied greatly across states and nations. (*Indicator 9*)

- In the G–7 countries for which data are available, 1991 preprimary education enrollment for 3-year-olds ranged from approximately 20 percent in Japan to almost 100 percent in France. In the United States, about one-third of 3-year-olds were enrolled.
- None of the states had an enrollment rate higher than 39 percent among 3-year-olds, while 7 of 14 other countries did.

In the 50 U.S. states and in most industrialized countries, participation in primary and lower secondary education (the equivalent of grades 1 to 9 in the United States) has become almost universal, and in most cases is legally mandated. Upper secondary education (the equivalent of U.S. grades 10 to 12) encompasses the final stage of compulsory education in most industrialized countries. Because the age at which students can legally leave school typically arrives before their secondary education is complete, participation rates for those age 16 and older reflect the desirability and importance of secondary education credentials (like the high school diploma).

Furthermore, the nature of secondary education varies across countries. For example, in Germany and Austria, many vocational students obtain the equivalent of apprenticeship training in a basic skill while enrolled in secondary school. Some of them even return to secondary school later, after gaining several years' work experience, to obtain a second credential, typically in a higher skilled trade. In the U.S. states, participation in secondary education was minimal beyond age 18, whereas enrollment rates for 20- and 21-year-olds were significant in some countries. (*Indicator 10*)

- In 9 of the 19 other countries, over 20 percent of 19-year-olds attended secondary school; however, none of the U.S. states had enrollment rates above 10 percent among 19-year-olds. Likewise, among 21-year-olds, 7 of the 19 other countries had rates above 5 percent, while none of the U.S. states had rates above 3 percent at that age. (*Indicator 10*)

Participation rates continue to drop off as secondary students make the transition to non-university higher education (the equivalent of U.S. community colleges) and university education (4-year colleges and universities in the United States), although some countries and states are higher than others. For example, higher education enrollment rates are generally much higher in the United States and Canada than in other industrialized countries. (*Indicator 8*) When students are counted at the location of their higher education institution rather than at the location of their original residence entry ratios into higher education at the entry reference age ranged from approximately 74 percent in North Dakota to 15 percent in Turkey. (*Indicator 11*)

In some countries, higher education is highly career-oriented, and admission is often quite selective. In the U.S. states, however, the higher education system in general is less selective and is available to almost any high school graduate. Many U.S. students also enter higher education without focusing on a particular career, while their peers in many other countries focus exclusively on their area of specialization from day one of higher education.

- Among 18- to 21-year-olds in 1991, the United States had relatively high full-time enrollment rates in non-university higher education (7.5 percent), as did Canada and France. (*Indicator 12*).
- There was much variation in full-time enrollment rates of 18- to 21-year-olds in non-university higher education in both U.S. states and other countries. The range was wider across the states, however, than across the countries. The states ranged from 0.3 percent enrolled in the age group in South Dakota to 18.3 percent in Wyoming for a difference of 18 percentage points, while the countries ranged from 0.7 percent in Denmark to 14.0 percent in Belgium for a difference of 13.3 percentage points. (*Indicator 12*)
- In university education, the U.S. states generally had higher full-time enrollment rates among 18- to 21-year-olds than did the countries for which data were available. Full-time enrollment rates exceeded 20 percent in 36 states, but did so in only 2 countries. The range of part-time enrollment rates among 18- to 21-year-olds was wider across the states than across the countries.

- Part-time enrollment rates were 6.2 percent in Alaska, and 2.3 percent in Australia, the country with the highest rate. (*Indicator 13*)

In summary, participation in formal education was virtually universal in every state and country for youths at the primary and lower secondary levels. Enrollment rates in early childhood education fluctuated across countries and states, with rates ranging from 0 to almost 100 percent for each age of preprimary enrollment. Early childhood enrollment in the U.S. states was most prevalent among 5-year-olds, with sparse enrollments among children aged 3 and 6 (most 6-year-olds in the United States are enrolled in primary school). Participation was nearly universal for only part of the upper secondary years; enrollment rates dropped dramatically in some countries beginning at age 16. Higher education participation rates were highest in Canada and the United States and more people enrolled in university than non-university higher education in every country except the Netherlands.

Section 3: Processes and Institutions

The indicators in this section measure two components of the instructional arena — the instructional process and the organization of personnel serving students' instructional needs. The instructional process involves both the time spent in the classroom — how students are taught and the tools used to teach them — and the effort required of students at home to reinforce classroom learning. Indicators in this group are:

(14) Staff employed in education;
(15) Number of schools and school size;
(16) Class size;
(17) Students use of technology;
(18) Student time spent doing homework and watching television;
(19) Instructional strategies in mathematics courses; and
(20) Time in formal instruction.

How does the amount of time students in the United States spend in the classroom compare to that of students in other countries? Do students in the United States spend more or less time doing homework or watching television than their international counterparts?

Although the number of days per year that U.S. students spend in school is generally lower than that in other countries, the hours of instruction per day often are greater. For the most part, the U.S. states had a higher average number of hours per year in formal instruction than the other industrialized countries. (*Indicator 20*)

- The average hours of instruction per year in the United States (1,003) exceeded that of 13 of the other countries for which data are available. Only France, Taiwan, China, Switzerland, and Scotland had more instructional hours annually; the former West Germany and Israel had about the same.
- U.S. states and most countries were fairly evenly distributed throughout the range defined by Ireland (931 hours of instruction per year) and China (1,276 hours per year). Nonetheless, 7 countries had less than 900 hours of instruction per year.

When not in class, however, lower secondary students in the United States reported doing less homework than did their counterparts in most other countries. Across the states, between 19 and 34 percent of public 8th grade students reported that they did 2 or more hours of homework each day. Instead, U.S. students spent more time watching television than did students in most other countries for which data are available. Across the states, between 72 and 90 percent of public 8th grade students reported watching 2 hours or more of TV daily. (*Indicator 18*)

- The percentage of public 8th grade students in the states who reported doing 2 or more hours of homework daily was generally lower than it was for 13-year-old students in the other countries for which data are available. Twelve of 18 other countries had percentages above 40, whereas none of the states did.
- Among the states, only Utah, Wyoming, and Colorado had less than 80 percent of 8th grade public school students report watching TV for 2 hours or more daily. However, 12 of the 18 other countries had percentages that low.

How do teaching strategies employed in mathematics classrooms differ across countries and states?

Similar resources can be applied in quite different ways to achieve desired educational goals. Sometimes the manner in which instruction is organized derives from tradition or some other cultural context; other times, it may result from an explicit policy decision to adopt one instructional strategy over another. For example, 8th grade mathematics classes in U.S. public schools were more likely to be organized by ability groups than their counterparts in other industrialized countries. Ability grouping was used more frequently only in England, Israel, Ireland, and Taiwan. It must be kept in mind, however, that ability grouping can occur at the school, in addition to the class level. School-level tracking (or streaming, as it is called in England) occurs both in countries that allow greater parental choice of schools and in those that assign students to either vocational or academic lower secondary schools based on their prior academic performance.

- For the most part, a higher percentage of students were in math classes based on ability in the U.S. states in 1992 than in the other nations for which data are available in 1991. Fourteen of 19 nations, but only 1 state, had less than 40 percent of their students in math classes based on ability. (*Indicator 19*)

Another instructional strategy is to have students work in small groups within classes. In 1991, 49 percent of U.S. 13-year-olds reported working in such small groups in their mathematics classes each week. A higher percentage of students reported working in small groups in 8 of the 18 other countries for which data are available. (*Indicator 19)*

- In 13 of 18 other nations, over 40 percent of 13-year-olds reported working in small groups in their math classes at least once a week. In only 4 states did 8th grade public school students report working in small groups that often.

Relative frequency of classroom testing is another form of instruction for which cross national data are available. U.S. 13-year-olds were more likely to take math tests or quizzes weekly than their counterparts in almost all of the other nations included — only Taiwan and Jordan had equal or higher frequencies. (*Indicator 19*)

- In 11 of 18 other countries, 40 percent or fewer of the 13-year-olds reported taking math tests or quizzes at least once a week. In every state, at least 40 percent of public 8th grade students reported being quizzed that often. Louisiana, Taiwan, Mississippi, and Alabama had percentages greater than 80.

Are U.S. students more or less likely than their counterparts in other countries to use computers and calculators in the classroom?

Some educators argue that technology, effectively employed, can assist students in developing higher-order thinking skills. Two of the more common technologies utilized by teachers and students are calculators and computers. The use of calculators in class was relatively common in the United States in 1991, with 54 percent of 13-year-olds using them in school. Although this rate was about average for the countries, it was significantly lower than that in France, where 94 percent of the students used calculators in school. (*Indicator 17*)

- In 1991, 90 percentage points separated the countries with the highest and lowest rates of in-school calculator usage among 13-year-olds: France at 94 percent and Korea and Brazil at 4 percent. Half of all the nations for which data are available reported percentages of less than 50 percent. Across the U.S. states in 1992, calculator usage rates among public school 8th graders ranged from at least 87 percent in Minnesota and Maine to 47 percent in Mississippi.

In every U.S. state, at least a quarter of the students used computers for homework or school work. Half of the nations reporting data had lower rates of computer use. (*Indicator 17*)

- About a quarter of public 8th grade students in Tennessee reported that they use computers for school work or homework. Although this percentage was the lowest among the states, it was higher than in 9 other countries, including the former Soviet Union, Spain, and Taiwan. The students of Maine matched those of Slovenia in the highest rate of computer usage. (61 percent)

The instructional process is also affected by the way in which resources are organized in different education systems. Do the states and nations organize their instructional and non-instructional efforts differently? The organization of students and staff is the subject of the following three indicators: staff employed in education, class size, and the number of schools and average number of students per school.

How do the states and nations compare in their level of staffing?

A large proportion of the labor force employed in education reflects an extensive education system. Among the several industrialized nations for which data are available, teaching and non-teaching staff employed in education comprised between 3 and 7 percent of the total labor force. In the United States this proportion was 5.6 percent, slightly below France's 5.9 percent, but well above Japan's 3.1 percent. Countries vary, however, in the degree to which social and other non-instructional services are provided directly by the schools. In the United States, for example, school districts commonly pay directly for school-based health services, school cafeterias, pupil transportation, vocational and psychological counseling, building construction and maintenance, and administrative management of the schools. In other countries, many or all of these services are either provided by non-education public authorities (such as the Ministry of Health) or by the private sector. The United States had the largest non-teaching staff in education, as a percentage of the total labor force (2.9 percent), of the 7 countries reporting data. (*Indicator 14*)

- The range across countries in the percentage of the total labor force employed in teaching was 3 percentage points: from about 2 percent in Turkey to over 5 percent in Belgium. This exceeded the range across the states of 1.4 percentage points: from 2.2 percent in Florida to 3.6 percent in Alaska.
- For the 6 countries other than the United States for which data are available, teaching staff outnumbered non-teaching education staff. Teaching staff outnumbered non-teaching staff in 18 of the 49 U.S. states for which data are available.

How do the states and nations compare in their class sizes?

The number of students a teacher faces during a period of instruction — measured as average class size — is an indicator of the typical teacher's pupil load. Small classes may allow students to receive more personal attention from their teachers. Large classes, however, can be less expensive and do not necessarily hinder instruction. Depending on teaching style, student behavior, and other factors — such as the opportunity for students to meet with teachers outside of class — large classes may function as effectively as small ones.

- The countries reported a wide range of average class sizes, from 18 in Switzerland to 49 in Korea. That range is three times wider than the range across the states, from 19 in Wyoming and Vermont to 30 in Utah. (*Indicator 16*)

How do the states and nations compare in their school sizes?

School size may be determined by population density or a more deliberate organizational policy. The prevailing educational philosophy in the United States for the past three decades has been that large schools could offer more comprehensive curricula and a wider variety of programs at lower cost. Small schools, however, may have beneficial effects upon student participation, attendance, satisfaction, and achievement. (*Indicator 15*)

- Students were organized into larger schools in the United States than they were in most other countries. Only Taiwan and Korea, among 12 other countries, had larger schools on average than did the United States at the preprimary through secondary level. Only Germany, Taiwan, and Korea, of 10 other countries, had larger schools at the higher education level.
- The average number of students per preprimary through secondary school in Taiwan was 873, a figure more than five times greater than those of Finland or France, the countries with the smallest averages (at 156 and 166, respectively). For the most part, the schools in the U.S. states from the preprimary through secondary levels were larger than those in other countries: schools in 28 states, but only 2 countries — Korea and Taiwan — averaged above 400 students.

- The U.S. states generally had higher average numbers of students per school at the higher education level than did the other countries. Five states, but none of the countries, had averages above 6,000; whereas half of the other countries, but only 15 of the states, had averages below 3,000.

In summary, although students in the United States spent fewer days per year in school, they received a larger number of instructional hours per day than students in most other industrialized countries. U.S. students, therefore, received more instructional hours per year than did students in the majority of industrialized countries included here. The type of instruction students receive in class and the prevalence of student adoption of common instructional technologies varied across countries and states. U.S. lower secondary students were more often placed in math classes according to ability than were students in other nations. U.S. lower secondary teachers also tended to give math tests or quizzes more often than teachers in other countries; 68 percent of U.S. 13-year-olds reported taking a math test or quiz at least once a week. Work in small groups was also more common in lower secondary math classrooms in the United States than it was in math classrooms in other countries. Calculator usage was of average prevalence among U.S. math students (54 percent) compared to that among students in other industrialized nations, where, in 12 of 17 other countries, calculator usage was either above 70 percent or below 30 percent. However, the use of computers for homework and school work was more common among students in the United States than it was among their international counterparts. At least 25 percent of public school 8th-graders in each U.S. state claimed to use computers for school work or homework.

Outside of class, students in other nations generally reported spending less time watching television and more time doing homework than students in the United States. Only 29 percent of 13-year-olds in the United States did 2 hours or more of homework each day — a percentage lower than that in all but 4 other countries included here. Eighty-four percent of U.S. students watched TV for 2 hours or more daily.

In the United States, teaching and non-teaching staff employed in education accounted for 5.6 percent of the total workforce, an average proportion in comparison to that of other countries. The percentage of the total workforce employed as non-teaching educational staff, however, was higher in the United States than in any other industrialized nation included here. In no other country reporting data, but in almost two-thirds of the U.S. states, non-teaching staff outnumbered teaching staff. Compared to other countries, the organization of education personnel in relation to students resulted in larger schools for the most part (at both the primary-secondary and higher education levels) but smaller classes (at the lower secondary level).

Section 4: Achievement and Attainment

There are many outcomes of education. The six indicators in this section provide information on educational attainment; completion rates for programs of study; and exhibited academic skills and knowledge. They are:

(21) Educational attainment of the population;

(22) Educational equity for women;

(23) Secondary school completion;

(24) University completion; and

(25) Mathematics achievement (experimental).

The organization of levels of education in the United States is often quite different than it is in other countries. In most countries the end of compulsory education is the completion of lower secondary education which is roughly equivalent to 8 or 9 years of education. In the United States, compulsory education is described in terms of age or the completion of high school. For example, most states require young people between the ages of 6 and 15 to be enrolled in school. In many countries, upper secondary education is differentiated; that is, several different types of programs are available. Some programs are designed to prepare young people to work in a particular occupation; others are designed to prepare young people to pursue studies at a university. In the United States, almost all high schools (grades 9 to 12) are comprehensive, providing both academic and vocational courses; however, the latter is rarely of great depth.

Despite differences in the organization of education, it is useful to compare the educational attainment of the population in states and countries in order to compare the investment people in these states and countries have made in their own education.[iii]

How well educated are the citizens of the states and the industrialized countries?

Although there was considerable variation among U.S. states, most had higher levels of educational attainment than most of the other industrialized countries. (*Indicator 21*) For the most part, the percentages of 25- to 64-year-olds who had finished high school in the states were greater than the percentages of 25- to 64-year-olds who had completed upper secondary education in other countries — for the purposes of international comparisons, high school completion is regarded as roughly equivalent to upper secondary completion. University completion rates (a bachelor's degree or higher in the United States) for this age group in the other industrialized countries ranged from 3 percent in Portugal to 17 percent in Canada, while the percentage holding this level of education in the states ranged from 14 percent in West Virginia to 31 percent in Massachusetts and Connecticut.

Included in the age range of 25 to 64 are many people who grew up in an era when educational opportunities in their countries, particularly for higher education, were less available than they are today. It is, therefore, illustrative to compare levels of educational attainment of older and younger members of the working-age population. For all countries and all but 3 states, high school (upper secondary) attainment levels were higher for younger people (25- to 34-year-olds) than for older people (25- to 64-year-olds). This indicates that over time larger and larger percentages of new cohorts are finishing high school or its equivalent. (*Indicator 21*)

- Across the states, the percentage of 25- to 34-year-olds having attained at least an upper secondary level of education (high school or more) ranged from 77 percent in Mississippi to 93 percent in Minnesota and North Dakota. Across other countries, the distribution was wider, ranging from 22 percent in Turkey to 88 percent in Norway, Germany, and Switzerland.

The same trend is not as prevalent for college completion. In 2 of 21 countries and in 18 of the U.S. states, the proportion of persons in the older age cohort completing university education (a bachelor's degree or higher in the United States) exceeded that in the younger age cohort. (*Indicator 21*)

- University completion rates were generally higher for U.S. states than for other industrialized countries. The percentage of 25- to 34-year-olds holding bachelor's degrees ranged from 14 percent in Nevada and West Virginia to 34 percent in Massachusetts, while university attainment rates in other countries ranged from 5 percent in Spain to 18 percent in Canada.

Is there a gap between the levels of educational attainment reached by women and men in the nations and states?

To illustrate whether or not women share in the educational opportunities available to their male counterparts in their nation or state, the percentage of various educational attainment groups who were women are compared across countries and states. Because women represented about 50 percent of 25- to 64-year-olds in each state or country, percentages above 50 percent suggest women were over represented in the group, and percentages below 50 percent suggest they were underrepresented in the group. In general, U.S. women seem to have fared better than women in other industrialized countries relative to their male counterparts in attaining upper secondary and university levels of education. Across all nations and states, however, women continued to compose a smaller proportion than men of the population having attained a university degree. (*Indicator 22*)

- In 15 of the 20 other countries represented here, over half of women 25 to 64 years old had not completed upper secondary education. However, women comprised that large a proportion of high school dropouts in only 2 U.S. states.
- In every country or state, women comprised less than half of 25- to 64-year-old university graduates (college graduates in the United States). In 14 of the 20 other countries represented here, the percentage of college

graduates who were women was 43 percent or less. However, in only 3 of the U.S. states was the percentage who were women that small.

How well do American students compare to students of other nations in mathematics achievement?

To compare the performance of students in states and nations on mathematics performance, an experimental indicator was developed. The mathematics proficiency scores of participants in the Second International Assessment of Educational Progress (IAEP) were mapped to a scale used to report scores of U.S. students in the National Assessment of Educational Progress (NAEP). This cross-linking allows comparisons of the average and percentile scores of 13-year-old students in selected industrialized countries (not all of them OECD members) to 8th graders from public schools in selected U.S. states. (*Indicator 25*) The NAEP scale for mathematics ranges from 0 to 500. The supplemental note to *Indicator 25* addresses the conceptual issues surrounding the task of linking two different assessments and the effects of alternative methods of linking assessments on the results.

- Among the 7 largest countries (who assessed virtually all age-eligible children) the average proficiency score of 13-year-olds ranged from 262 in the United States to 285 in Taiwan. The average proficiency score was 273 in France and 270 in Canada.
- The range in average mathematics proficiency across states was similar to the range across countries. Average proficiency scores for public 8th grade students in 1992 ranged from 246 in Mississippi to over 280 in Iowa, North Dakota, and Minnesota. Average scores for 13-year-olds students in 1991 ranged from 246 in Jordan to over 280 in Taiwan and Korea.
- Over 25 percent of 13-year-olds in Taiwan and Korea scored above 300 in 1991, while about 10 percent of students of the same age scored above that level in the United States. However, in 4 states 25 percent or more of U.S. 8th grade public school students (who are generally older than 13 years) scored above this level in 1992.

To help interpret these differences, it is useful to consider another type of comparison: differences within the United States between the mathematics proficiency of better and poorer performers of the same grade level. The 10th percentile of mathematics proficiency among public 8th grade students in Mississippi was 201, and the 90th percentile was 291, a difference of 90 points, which is more than twice the 39-point difference between the average Taiwanese 13-year-old and Mississippi 8th grader. This suggests that variation among students within countries is far larger than variation in averages between countries.

In summary, the population of 25- to 64-year-olds in the United States generally had higher levels of educational attainment than did their international counterparts. The proportion of this age group that completed lower secondary education or less was smaller in the United States than it was in 18 of the 20 other countries included here. Inversely, of all the countries for which data are available, the United States had the second highest percentage of this age cohort that attained an upper secondary education, and the second highest proportion that attained a university education. However, much of the gap in educational attainment between the U.S. and other countries has narrowed considerably in recent years, as one can see by looking at the educational attainment rates in the younger age groups.

Section 5: Labor Market Outcomes

Although the four indicators in this section also measure educational outcomes, they focus on long-term outcomes, such as unemployment rates and earnings among graduates of various levels of schooling. and gender differences in earnings. The labor market outcome indicators are:

(26) Unemployment and education;
(27) Earnings and education;
(28) Gender difference in earnings; and
(29) New scientists and engineers.

What are the long-term economic effects of educational attainment in states and nations?

In general, higher levels of educational attainment are associated with lower rates of unemployment and higher earnings. In the United States in 1990, the unemployment rate for 25- to 64-year-olds who did not complete high school was 5 percentage points higher than for high school graduates. In 19 countries and all 50 U.S. states, the unemployment rates for university graduates were lower than for those with only the equivalent of a high school education.

The relationship between education and earnings can be illustrated by calculating the mean annual earnings for a particular level of educational attainment as a percentage of the mean annual earnings of workers who completed just upper secondary education. For example, in 46 states and 7 of 12 countries university-educated males had mean earnings percentages of 150 or greater on this measure; that is, they received a 50 percent premium in earnings compared to their counterparts who only completed upper secondary education. The strength of the earnings and education relationship is indicated by the difference between the earnings premium of being a university graduate to the earnings disadvantage of completing, at most, lower secondary education. In general, the relationship between earnings and educational attainment was stronger in the U.S. states than in many other countries.

- Almost without exception, higher levels of educational attainment were associated with lower rates of unemployment. Switzerland was an exception. Although their unemployment rates were generally very low, they were somewhat higher among university graduates than among those with lower educational credentials. (*Indicator 26*)
- In the United States in 1990, the unemployment rate for people who had not completed high school (10.4 percent) was more than double that for those who had completed high school but not gone on to college (5.1 percent). A large difference in unemployment rates between those two education levels (lower and upper secondary) also existed in Canada (5 percentage points), but was not quite as large in France, Germany, or the United Kingdom (each 4 percentage points). (*Indicator 26*)
- In all countries and all states in the early 1990s, higher levels of education were associated with higher mean annual earnings. (*Indicator 27*)
- For university-educated females, 45 states and 9 of 12 countries had earnings ratios of 150 or greater. Similarly, for university-educated males, 46 states had ratios of 150 or greater, as did 7 of 12 countries. (*Indicator 27*).
- In all the countries represented here, not having completed an upper secondary education resulted in the lowest earnings ratio. In 1991, Portugal had the lowest earnings ratio among the countries for the lowest level of educational attainment: below 70, for both males and females. Not having finished high school by 1990 resulted in earnings ratios that low for males in California, Louisiana, and Texas, as well as for females in those three states and also Colorado, Delaware, and Virginia. (*Indicator 27*)

How well have women fared relative to their male counterparts in earnings in the states and in the nations?

As *Indicator 22* illustrated, not only did women still constitute a smaller portion than men of those having attained a university level of education in states and nations, but earnings within that attainment population were also unequally distributed when broken down by gender. U.S. women seem to have fared better than women in other industrialized countries relative to their male counterparts in attaining upper secondary and university levels of education. But, they were generally paid less than women in other industrialized countries relative to their male counterparts at these levels. (*Indicator 28*) Included in the age range 25 to 64, however, are many people who grew up in an era when occupational opportunities for women were less available than they are today. Thus, even if selection for jobs is made equitably from this point forward, the disparity in earnings would take some time to dissipate.

- In all countries and states, the average annual earnings for females aged 25 to 64 was less than that of males of the same age cohort and level of educational attainment.
- Half of the other countries included here reported ratios of mean annual earnings of women to men of 64 or more in 1991. All of the U.S. states had lower ratios in 1990. A similar pattern held for three of the four levels of educational attainment: half the countries had ratios of mean annual earnings of women to

men higher than the ratio of the U.S. state with the highest ratio.

Do more students in the United States pursue careers as scientists and engineers than in other countries?

At first glance, it would appear that the U.S. education system puts more emphasis on science and engineering training in its higher education system than do the education systems in other countries. Science and engineering graduates generally comprise a larger proportion of their age group (at a typical graduation age — 22 years old) in the United States than they do in other countries. (*Indicator 29*) But, then, as was mentioned previously, the U.S. graduates more persons in the typical age group in general, regardless of the type of degree. When the number of science and engineering degrees in a nation or state are counted as a proportion of all degrees, the U.S. proportion is much lower than that in most countries.

- In 1991, the number of U.S. university students who graduated with science or engineering degrees amounted to about 5 percent of the population of 22-year-olds. Among the G–7 countries in various years between 1988 and 1991, only Japan and Canada produced higher percentages of science and engineering degrees. Germany's percentage was about the same as the United States'.
- Four out of 30 other countries (Finland, Bulgaria, Japan, and South Korea) had percentages of science and engineering degrees among 22-year-olds of 6 or above. Twenty of the states had percentages that high.

In summary, educational attainment exhibited a strong correlation with labor market outcomes as measured by unemployment and earnings. Educational attainment was positively associated with annual earnings and negatively associated with unemployment rates in all states and all countries, except Switzerland.

Gender differences in earnings indicate that women, in general, earn less than men. The ratio of mean annual earnings of women to men varied across states and countries, but in all cases, women earned less than men having the same educational attainment. In the United States, the ratio of earnings of women to men was lower at every level of educational attainment than that of most of the other industrialized countries reporting data.

Section 6: Finance

This section includes the following indicators of education finance:

(30) Current public expenditure on education as a percentage of GDP/GSP;

(31) Current public expenditure on education as a percentage of total public expenditures;

(32) Current public expenditure per student;

(33) Current public expenditure per student as a percentage of GDP/GSP per capita;

(34) Distribution of current public expenditure on education;

(35) Teacher salaries;

(36) Sources of funds for primary and secondary education; and

(37) Sources of funds for higher education.

Through most of this section, the focus is on expenditure from public sources, rather than on total investment in education, which would include money from private sources. In some cases, expenditure from private sources amounts to a substantial portion of total educational expenditure. However, financial data on private education are not available from some countries.[11]

Which countries and states provide the strongest financial support to education?

Financial support for education can be viewed from several different angles, each of which focuses on certain factors and not on others. For example, total expenditure on education is useful for determining who spends the largest sum of money on education, but may be misleading when comparing small countries or states to larger ones, for a small country may spend less in the aggregate but may spend more *per-student*. Likewise, a poorer country may spend as much per student as a richer country, seeming to make a greater effort to educate its citizens; however, that would not be apparent by looking only at aggregate spending or per-student spending.

Because there is no universally superior measure of public financial support for education, several indicators are presented here. The first, current public expenditure per student (*Indicator 32*), presents the amount of public financial support for one student's education in each country or state.

- At the primary through secondary level, the United States spent more public money per student ($4,605), and at the higher education level, the United Kingdom ($10,228) and Canada ($8,555) spent more per student, than the other G–7 countries.
- For the primary through secondary level, Sweden ($5,825) had the highest level of per-student public expenditure among the countries for which data are available; and Alaska, Connecticut, New Jersey, and New York had the highest levels among the states (all above $6,400). Japan, Australia, Spain, and Hungary all spent about the same or less than Mississippi, the lowest spending state ($2,648).
- At the higher education level, public expenditure per students varied greatly across both the countries and the U.S. states. The United Kingdom had the highest level of per-student expenditure among the countries ($10,228), although Alaska and Hawaii spent more. Spain and Japan both spent less public money per student on higher education than New Hampshire, the lowest spending state ($3,624).

An advantage of using per-student expenditure as an indicator of a nation's or state's financial effort to support education is that it takes into account the size of the student population. On the other hand, one disadvantage is that much of the variation between states and countries may in fact be caused by the relative wealth of that state or nation. The second finance indicator, current public education expenditure as a percentage of GDP/GSP (*Indicator 30*), is a measure of what states and nations spend on education in terms of the economic resources available to them.

- Of the G–7 countries, only Canada had a higher level of current public expenditure as a percentage of GDP (6.1 percent) than did the United States and France (both 4.6 percent). Canada's proportion was almost twice that of Japan's (3.1 percent).
- The distribution of levels of expenditure across states and countries was quite similar. Montana, Canada, West Virginia, Vermont, and New Mexico had the highest levels of educational expenditure as a percentage of GDP/GSP (6.0 percent or above). The lowest levels were found in Japan, Nevada, West Germany, and Delaware (3.3 percent or less).

Another disadvantage of the simple per-student expenditure measure is that much of the variation between states and countries may in fact reflect the relative size of the public sector in a nation or state. The third finance indicator, current public education expenditure as a percentage of total public expenditure (*Indicator 31*), attempts to show what states and nations spend on education in terms of the size of their public sectors generally.

- Finland, Canada, and the United States had the highest level of education expenditure as a percentage of total public spending among the countries represented here; West Germany and Italy, the lowest.
- The U.S. states' figures on this measure generally exceeded those of the countries represented here. Two-thirds of the countries reported levels of current public education spending as a percentage of all public spending to be lower than that of Virginia, the state with the lowest level.

The second and third finance indicators provide measures of a nation's or state's spending on education in relation to its available resources or in relation to its total public spending, but education spending is also highly influenced by the size of the student population. All other factors being equal, a country or state with a relatively small student population is likely to spend a smaller portion of its GDP/GSP or of its total public spending on education than a country with a large student population. Thus, the fourth finance indicator, current public education expenditure as a percentage of GDP/GSP per capita (*Indicator 33*), provides a measure of fiscal effort to support education that takes into account both a country's or state's available financial resources and the size of the student population. It is calculated by dividing the first finance indicator, public expenditure per student, by a nation's or state's per-capita gross product.

On this measure, some states and countries with higher per-student expenditure (*Indicator 32*) appeared to be not so high when their available resources were taken into account (*Indicator 33*).

- For example, of the 4 states — New Jersey, New York, Alaska, and Connecticut — with the highest per-student expenditure at the primary through secondary level, New Jersey, New York, and Connecticut remained among the states with the highest ratios of per-student expenditure to per-capita GSP. Alaska, however, fell below 43 other states, moving from the highest on the first measure to near the bottom on the second.
- On the other hand, among countries for which data were available, those with the highest per-student expenditure at the primary through secondary level — Sweden, Denmark, the United States, Norway, and Canada — remained the highest ranking countries even when available resources were taken into consideration. However, the United States fell lower when education expenditure was divided by gross product per capita.

Do states and countries differ in the relative proportion of public expenditure devoted to different levels of education?

Many factors affect this "balance," including the relative size of student populations and system-wide education goals and strategies. For example, some countries or states may choose to invest heavily in higher education in order to increase the number of professionals and managers, while others may feel a more pressing need to focus on basic education for the larger populace by providing more primary and secondary schools. It is important to note, however, that this indicator does not give a complete picture of the distribution of *total* resources between the two levels, since some countries (such as the United States, West Germany, and Japan) had considerable private funds going to education (see tables S3 through S6 in the Supplemental Notes for examples of the relative size of private expenditures across countries).

Regarding the balance of expenditure between levels of education (*Indicator 34*), the United States' expenditure on the primary through secondary level as a percentage of all current public education expenditure lay in the bottom half of the range among all the nations represented here. Of the G–7 nations, Japan, Italy, and France devoted a larger share of current public expenditure to this level. If West Germany's large "undistributed" proportions were allocated entirely to the primary-secondary level, its primary-secondary shares might exceed those of the United States as well. Hungary, Spain, and Sweden had the highest percentages of current expenditure at the primary through secondary level (without counting the undistributed proportion). New Jersey, New Hampshire, and Vermont, the highest-spending U.S. states, spent a slightly larger share at that level of education. At the higher education level, Australia, Canada, Utah, North Dakota, New Mexico, and Hawaii reported relatively high proportions of spending.

Where does the funding of education originate in each nation or state? What is the balance between public and private financing or among the levels of government?

Two more finance indicators trace the path of all education expenditures back to their origin among the levels of government and between public and private sectors. The initial source of money for education sometimes differs from the ultimate spender. For example, though local school districts in the United States generally operate and fund the local public schools, much of the financing arrives in the form of transfers from state governments. Some of the state money, in turn, arrives in the form of transfers from the Federal government. The *initial sources* of those transferred funds, then, are state and Federal governments. Likewise, the initial source of funds spent on public schools can be either public or private. Student tuition and fees are one example of a private source of public expenditure. Funding by private firms of youth apprenticeship programs in Germany and Austria is another example. Moreover, the initial source of funds spent on *private* schools can be either public or private. Unlike the United States, most other OECD countries maintain large numbers of privately-operated schools that are mostly or entirely publicly funded.

Tracking funds to their initial source illuminates where responsibility is actually assumed in a nation or state for financing education, either at the primary through secondary level (*Indicator 36*) or at the higher education level (*Indicator 37*).

- Of the 11 other countries reporting public elementary and secondary expenditure data by level of government, only Canada raised less money for education at the national level than did Mississippi, the U.S. state that relied the most on the Federal government for funds.
- In the United States, local government provided a portion of public higher education funding higher than that in any of the 11 other countries reporting data (6 percent). Conversely, the percentage of funds derived initially from the central government was lowest in the United States among all the nations. The United States and Belgium were the only 2 nations in which the share of public funding of institutions of higher education from the regional, or state, level exceeded 50 percent.

How much are teachers paid across nations and states?

Teacher salaries are an important indicator of both the level of investment in and the quality of a nation's or state's education system. Without exception across nations and states, teacher salaries constitute the greatest portion of education expenditure. The amount of money paid to teachers is a primary factor in attracting and retaining top-quality candidates to pursue careers as educators. Therefore, salaries influence the level of quality and experience with which students are instructed. This indicator (*Indicator 35*) presents data on average salaries for teachers for the United States and its states and for secondary school teachers with approximately 15 years of experience in other countries. The ratio of teacher salary to country or state per capita gross product is also included.

- The average teacher salary in the United States for the school year 1991 to 1992 was about $34,000. That was the median among the G–7 countries for mid-career secondary school teachers. The mid-career salaries in former West Germany, France, and Canada were highest (almost $40,000 in former West Germany). The mid-career salaries in England, Japan, and Scotland (representing the United Kingdom), and Italy were lowest (less than $22,000 in Italy).
- The range of mid-career secondary school teacher salaries was slightly wider across countries than the range of average salaries for teachers across states. Teachers in Connecticut, the state with the highest salaries, received twice the income of their counterparts in South Dakota. Secondary school teachers in Switzerland, the country with the highest-paid teachers, received almost two-and-a-half times the salary of Italian secondary school teachers.
- The ratio of a teacher's average salary to per capita gross domestic product was about 1.5 in the United States. That was higher than Italy's ratio for secondary school teachers (1.23) but lower than the ratios for other G–7 countries (England and Scotland as proxies for the United Kingdom). The ratios for France, former West Germany, England, and Scotland were about one-third higher than that of the United States.

In summary, a comparison of 1991 public education expenditures across countries finds that the United States spent more public funds *per student* at the primary through secondary level than did any of the other G–7 countries. At the higher education level, the United States spent more public money per student than the other G–7 countries except Canada and the United Kingdom. When public education expenditures are measured as a percentage of gross product, only Canada's ratio, among all the G–7 countries, exceeded that of the United States, whereas France's was about the same. Finally, combining two of the previous measures into a single measure of fiscal effort — current public education expenditure per capita divided by per capita gross product — finds Canada on top again, ahead of Italy, France, and then the United States among the G–7 countries.

Comparing the U.S. states to *all* the countries represented here (rather than just the G–7), sometimes presents a different picture of the relative level of public education spending in the United States. Particularly because some smaller northern European countries spent at higher levels, the distribution among states was more uniform than that among countries.

The proportional allocation of public education funds from among different levels of government varies widely across nations and states. The United States relied more on both state and local governments than did other countries.

Other related NCES projects

This second edition of ***Education in States and Nations*** continues a series of occasional reports comparing the education systems of different states and countries. This series, however, is just one part of an overall NCES international effort. NCES serves as the representative for the United States in the OECD's INES project mentioned earlier. In connection with the INES project, NCES commissioned two reports to improve the comparability of education finance data across countries: ***The International Expenditure Comparability Study*** and ***Improving the Comparability of International Expenditure Data.*** These studies have reviewed ten countries' statistical reports and interviewed their officials in order to identify differences in the content and categorization of expenditures, both in national finance statistics and in data submitted to the OECD and UNESCO. The studies have developed revised estimates of countries' education expenditures that adjust for deviations from an international standard. These reports should be available soon.

NCES has also sponsored another project to clarify the content of indicators published in international comparisons. ***Education Indicators: An International Perspective*** presents a set of indicators for the United States and other countries, along with additional information about the education systems in those countries. The various structures of the education systems and other contextual factors help to explain the structure of the indicators, and help U.S. readers understand the indicators in all their complexity.

These projects and others comprise a major ongoing effort to not only compare education systems across states and countries, but also to improve the comparability of data and to deepen understanding of the context of the data.

In addition to these indicators and research projects, NCES continues to work in cooperation with its counterparts in other countries to administer international assessments and collect and analyze their data. These projects include: the International Association for the Evaluation of Educational Achievement (IEA) Reading Literacy Study, conducted from 1989 to 1992; the IEA's Third International Mathematics and Science Study (TIMSS), being conducted now; the pilot testing of the OECD's Cross-Curricular Competency Test in 1995; and the International Adult Literacy Survey, conducted in 1994. The International Adult Literacy Survey (IALS) was a collaborative effort by seven governments and three intergovernmental organizations (UNESCO, Eurostat and the OECD) to fill the information gap on literacy in industrialized countries.

NOTES

[1] Many observers attribute the origins of the current wave of education reform in the United States to the 1983 publication of ***A Nation at Risk***. Other observers trace the origins to the late 1970s, when the first of many states passed student minimum competency requirements. The National Commission on Excellence in Education, which wrote ***A Nation at Risk***, and many others, however, would distinguish the "minimum competency movement" as an earlier, separate, and failed effort to reform education (see, for example, pages 19 to 21 of ***A Nation at Risk***).

[2] The explicit mission of the commission that wrote ***A Nation at Risk*** was to study "the quality of learning and teaching in our nation's schools." Since then, education reformers have often employed the language and methods of the historically parallel quality management movement. *Indicators* are needed in order to *monitor processes* and *measure progress* toward goals. *Outcome measures* are as important as *input measures*. *Goals and standards* should be universally accepted by stakeholders, clear enough to serve as a common focus, measurable, and challenging. Standards, or *benchmarks*, from outside one's own organization serve to ground plans in a reality not defined by vested interests.

[3] It should be recognized that, in this publication, the meaning of the word "state" is the U.S. version, a sub-national, regional jurisdiction. *National* jurisdictions are called "countries" or "nations" throughout.

[4] The other original National Education Goals were: 1) All children will start school ready to learn. 2) The high school graduation rate will increase to at least 90 percent. 3) Students will demonstrate subject area competency at grades 4, 8, and 12 and be prepared for good citizenship, further learning, and productive employment. 7) Every school will be free of drugs and violence and offer a safe, disciplined environment conducive to learning.

The two National Education Goals added in 1994 are: 4) Teachers will have access to programs to improve their skills. 8) Schools will promote parental involvement.

[5] Since 1991, the National Education Goals Panel has developed education indicators that pertain to progress toward the National Goals, which are published in the annual ***National Education Goals Report.*** Other organizations making similar national efforts include the Council of Chief State School Officers, the National Science Board, and the Education Commission of the States.

[6] The increased demand for information on education and the need for improved knowledge on the functioning of education systems raised many questions not only for data collection but also the organization, reporting and interpretation of the data. These questions led authorities in the member countries of the OECD to consider new ways of comparing their education systems. Agreement was reached on the feasibility and utility of developing an international set of indicators that

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would present in statistical form the key features of the education systems of the member countries.

The Centre for Educational Research and Innovation responded to this demand for comparative information by initiating the Indicators of Education Systems Project (INES). This project grew out of two preparatory conferences: one hosted by the government of the United States in November 1987, and the second by the French authorities in March 1988. A meeting to review progress and discuss the plan of work was subsequently convened in Austria in September 1989. The results achieved during the initial phases of the project were presented at an international conference in Lugano, Switzerland in September 1991.

[7] The nations of the OECD include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. Because Greece and Iceland did not participate in the OECD's Indicators of Education Systems (INES) project, data on these countries are not included in this report. Data for several OECD observer countries, such as Hungary and the former Czechoslovakia, are included as data are available.

[8] ***Education at a Glance*** was the product of a collective effort to improve the gathering and reporting of comparative information on education in the OECD countries. In the process of developing the indicators, CERI established an international consultative mechanism for exchanging viewpoints and creating a common understanding of issues related to the definition, measurement, and organization of the indicators. ***Education at a Glance*** thus represents the combined effort of several networks and technical groups composed of policy-makers, administrators, and researchers.

The indicators were influenced by the concerns of the different parties that were involved in their development. Three principles guided the work. The first was that the indicators be targeted to a broad audience. Second, total coverage through a large and complex set of measures was not the aim; rather, the indicators were selective and intended to be policy-relevant, providing information useful for decision-making and evaluation. Third, in addition to being reliable and valid at the national level, the indicators were standardized in a way that makes them comparable among the OECD countries.

[9] Several other OECD countries have federal systems like the United States' in which a major responsibility for education rests with regional (provincial or state) governments. These countries are Australia, Belgium, Canada, Germany, Switzerland, and the United Kingdom.

[10] Again, international comparisons based on levels of education can sometimes cause confusion because the levels do not always have the same entrance requirements or the same duration across countries. To aid in understanding such comparisons, an explanatory note is included in the supplemental notes, starting on page 231.

[11] See supplemental note on private higher education expenditure in Japan and the United States on pages 236 to 242.

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INDICATORS

H 3

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BACKGROUND INDICATORS

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Indicator 1: Population and area

A country's or state's population and area influence both the organizational structure and the infrastructure of its education system. Countries or states with large populations tend to have large numbers of school-age children and face a greater demand for educational services. Countries or states with large areas face greater challenges in providing educational services since they must spread them over a wider geographical domain. High population densities may make it more efficient to support a wider range of specialized education and training opportunities. Each of these factors may influence the degree to which an education system is centralized and its ability to provide a wide range of services, but may only become critical in cases where population, area, or density is either extremely large or extremely small. Otherwise, factors such as culture, history, and economics may have a stronger influence in determining the structure of an education system. In this indicator, the sizes of the U.S. and its fifty states are compared to those of most of the current and prospective members of the Organization for Economic Cooperation and Development.

- **Three OECD countries — the United States, Canada, and Australia — have extremely large areas. Of the remaining countries, none has an area as great as one tenth the area of the United States.**

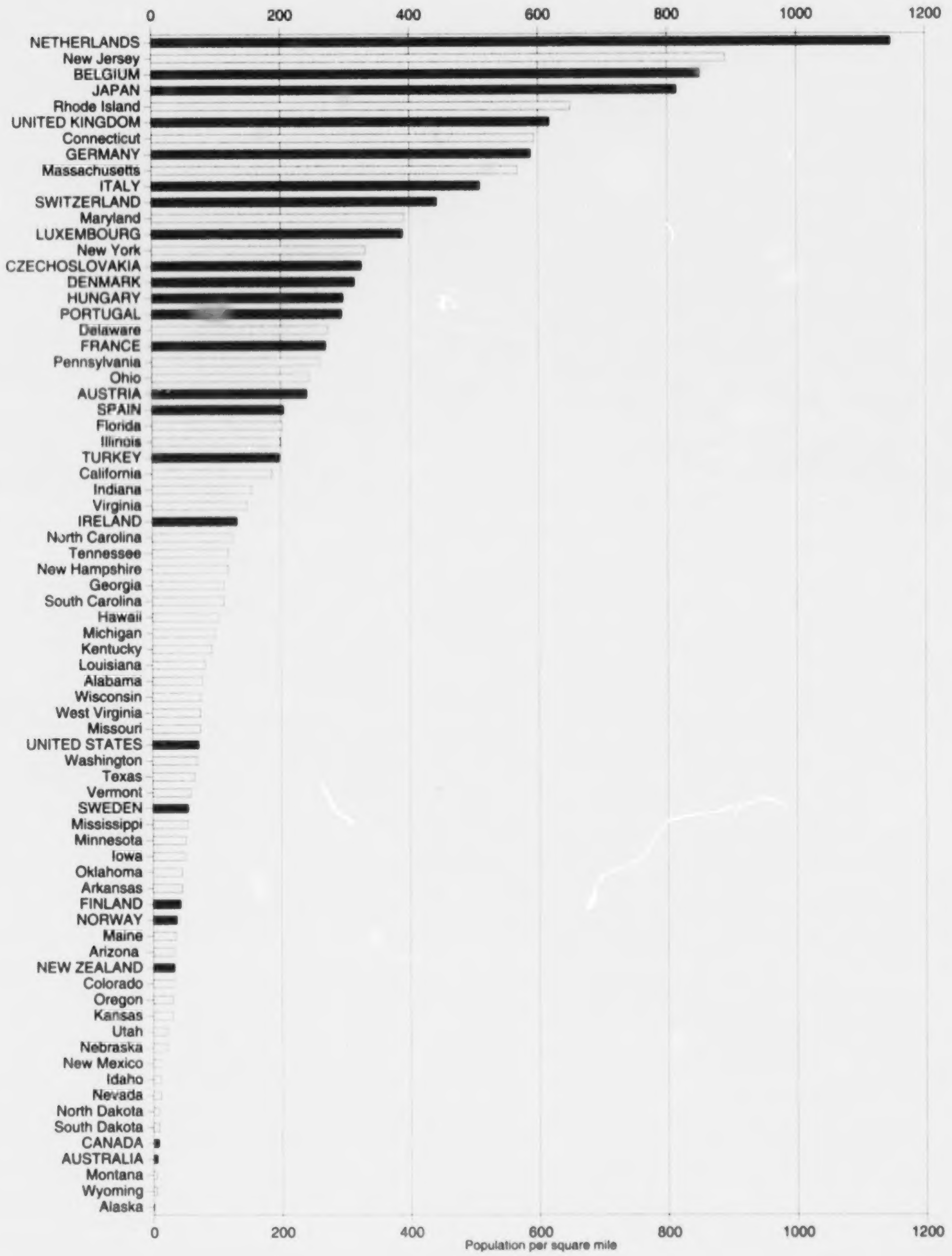
- **The United States was by far the most populous OECD country in 1991, with a population over twice as large as that of the country with the next largest population, Japan.**

- **While no state has an area near the size of one of the three largest OECD countries, Alaska, Texas, and California each have areas greater than at least 18 of the 23 other nations included here.**

- **California was the most populous state in 1991, with 12 million more persons than New York. Other states with populations greater than 10 million included New York, Texas, Florida, Pennsylvania, Illinois, and Ohio. Seven states had populations of less than 1 million.**

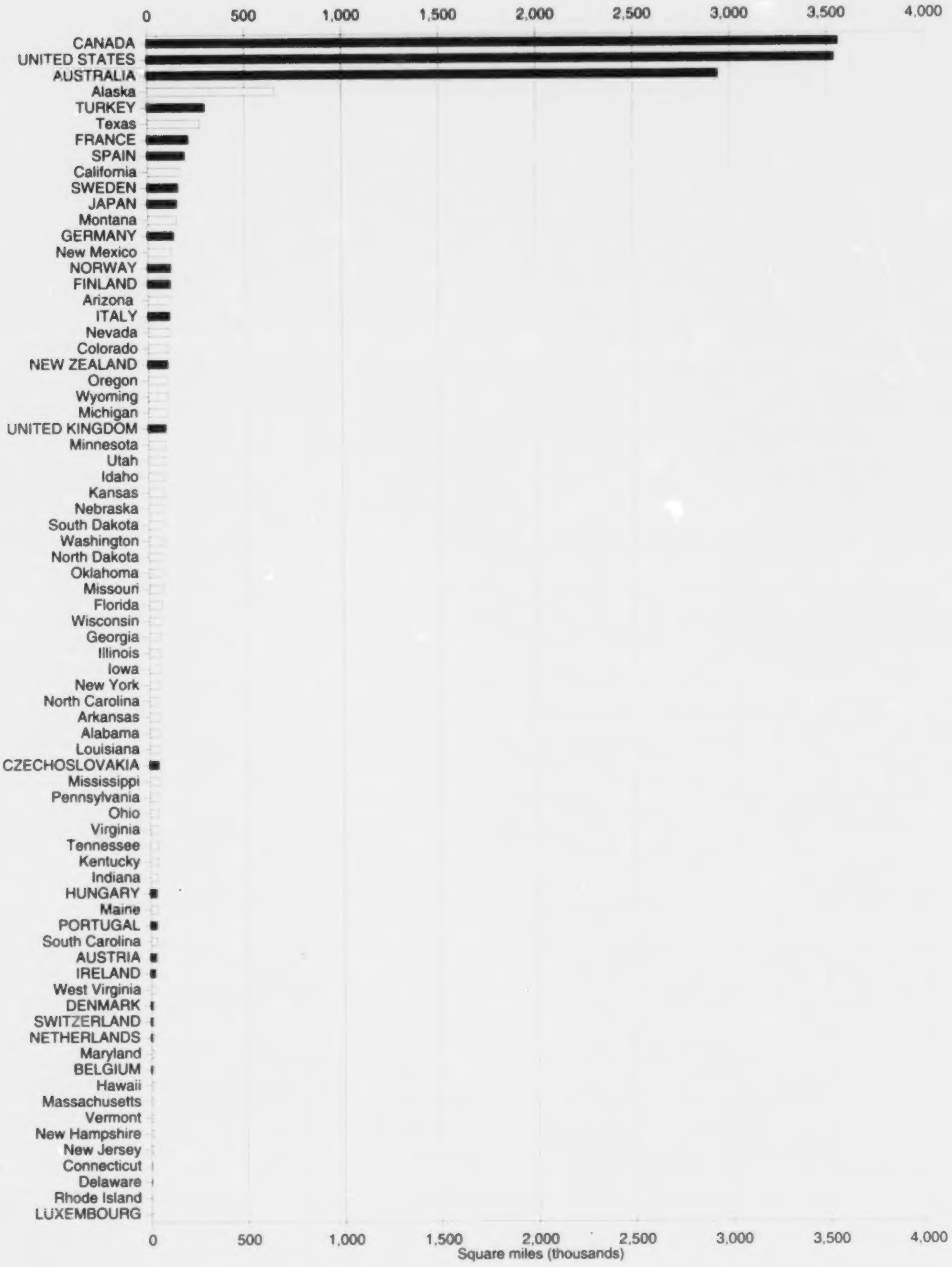
- **The range of population densities across the states paralleled the range across the OECD countries. At the low end, Alaska, Wyoming, Montana, North Dakota, South Dakota, Australia, and Canada all had population densities lower than 10 persons per square mile. At the high end, New Jersey, the Netherlands, Belgium, and Japan all had population densities higher than 800 persons per square mile.**

Figure 1a: Population density, by country and state: 1991



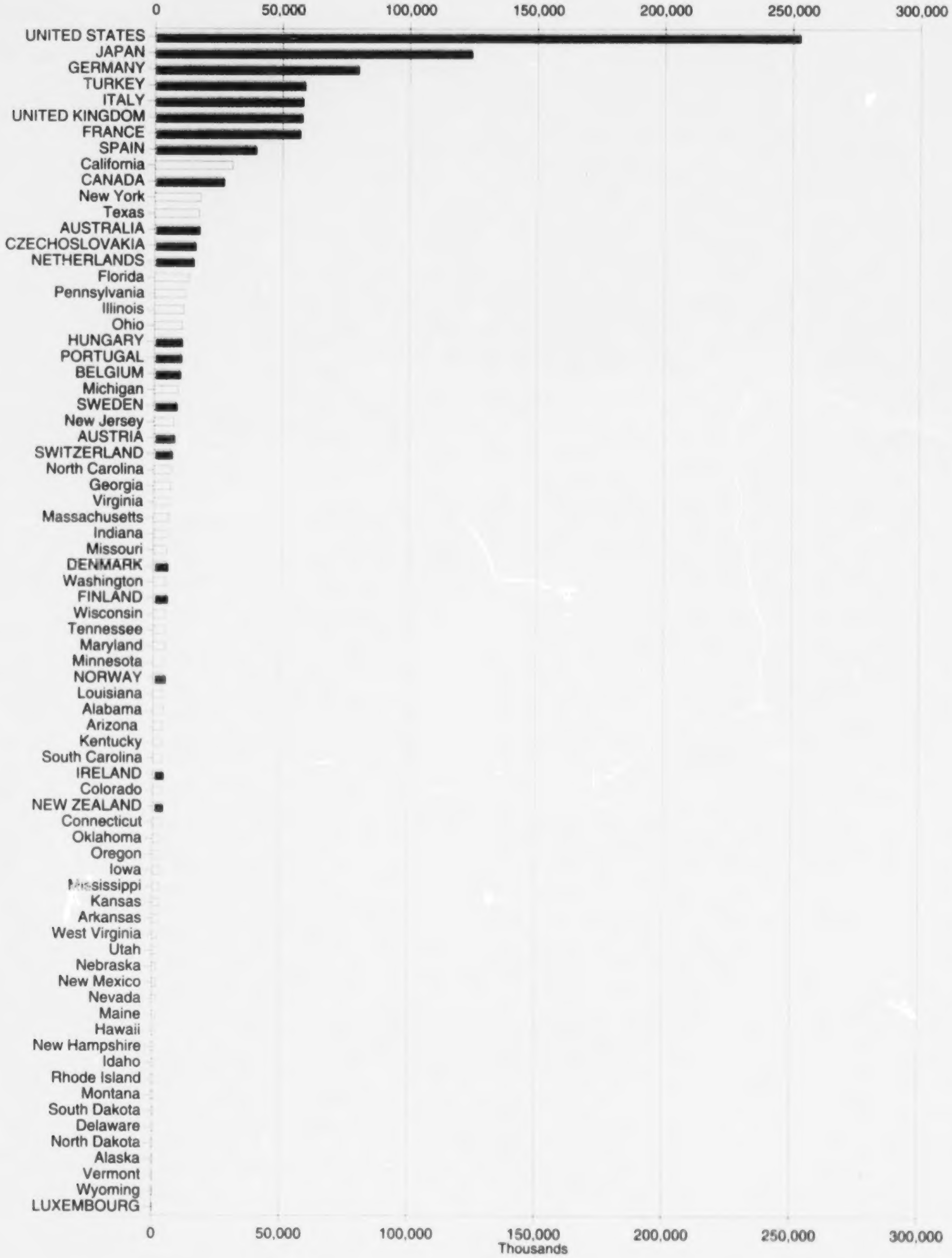
SOURCE: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 1992, Tables 25, 340, and 1359.

Figure 1b: Area, by country and state: 1991



SOURCE: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 1992, Tables 340 and 1359.

Figure 1c: Population, by country and state: 1991



SOURCE: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 1992, Tables 25 and 1359.

Table 1a: Population, area, and population density, by country: 1991

Country	Population (thousands)	Area (square miles)	Population density (persons per square mile)
Australia	17,288	2,941,285	6
Austria	7,666	31,942	240
Belgium	9,922	11,672	850
Canada	26,835	3,560,219	8
Czechoslovakia	15,725	48,440	325
Denmark	5,133	16,359	314
Finland	4,991	117,942	42
France	56,596	210,668	269
Germany	79,548	135,236	588
Hungary	10,558	35,653	296
Ireland	3,489	26,598	131
Italy	57,772	113,521	509
Japan	124,017	152,411	814
Luxembourg	388	998	389
Netherlands	15,022	13,104	1,146
New Zealand	3,309	103,734	32
Norway	4,273	118,865	36
Portugal	10,388	35,382	294
Spain	39,385	192,819	204
Sweden	8,564	158,927	54
Switzerland	6,784	15,355	442
Turkey	58,581	297,591	197
United Kingdom	57,515	93,278	617
United States	252,502	3,539,227	71

SOURCE: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 1992, Table 1359.

Table 1b: Population, area, and population density, by state: 1991

State	Population (thousands)	Area (square miles)	Population density (persons per square mile)
Alabama	4,089	52,423	78
Alaska	570	656,424	1
Arizona	3,750	114,006	33
Arkansas	2,372	53,182	45
California	30,380	163,707	186
Colorado	3,377	104,100	32
Connecticut	3,291	5,544	594
Delaware	680	2,489	273
District of Columbia	598	68	8,794
Florida	13,277	65,758	202
Georgia	6,623	59,441	111
Hawaii	1,135	10,932	104
Idaho	1,039	83,574	12
Illinois	11,543	57,918	199
Indiana	5,610	36,420	154
Iowa	2,795	56,276	50
Kansas	2,495	82,282	30
Kentucky	3,713	40,411	92
Louisiana	4,252	51,843	82
Maine	1,235	35,387	35
Maryland	4,860	12,407	392
Massachusetts	5,996	10,555	568
Michigan	9,368	96,810	97
Minnesota	4,432	86,943	51
Mississippi	2,592	48,434	54
Missouri	5,158	69,709	74
Montana	808	147,046	5
Nebraska	1,593	77,358	21
Nevada	1,284	110,567	12
New Hampshire	1,105	9,351	118
New Jersey	7,760	8,722	890
New Mexico	1,548	121,598	13
New York	18,058	54,475	331
North Carolina	6,737	53,821	125
North Dakota	635	70,704	9
Ohio	10,939	44,828	244
Oklahoma	3,175	69,903	45
Oregon	2,922	98,386	30
Pennsylvania	11,961	46,058	260
Rhode Island	1,004	1,545	650
South Carolina	3,560	32,007	111
South Dakota	703	77,121	9
Tennessee	4,953	42,146	118
Texas	17,349	268,601	65
Utah	1,770	84,904	21
Vermont	567	9,615	59
Virginia	6,286	42,769	147
Washington	5,018	71,303	70
West Virginia	1,801	24,231	74
Wisconsin	4,955	65,503	76
Wyoming	460	97,818	5

SOURCE: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 1992, Tables 25 and 340.

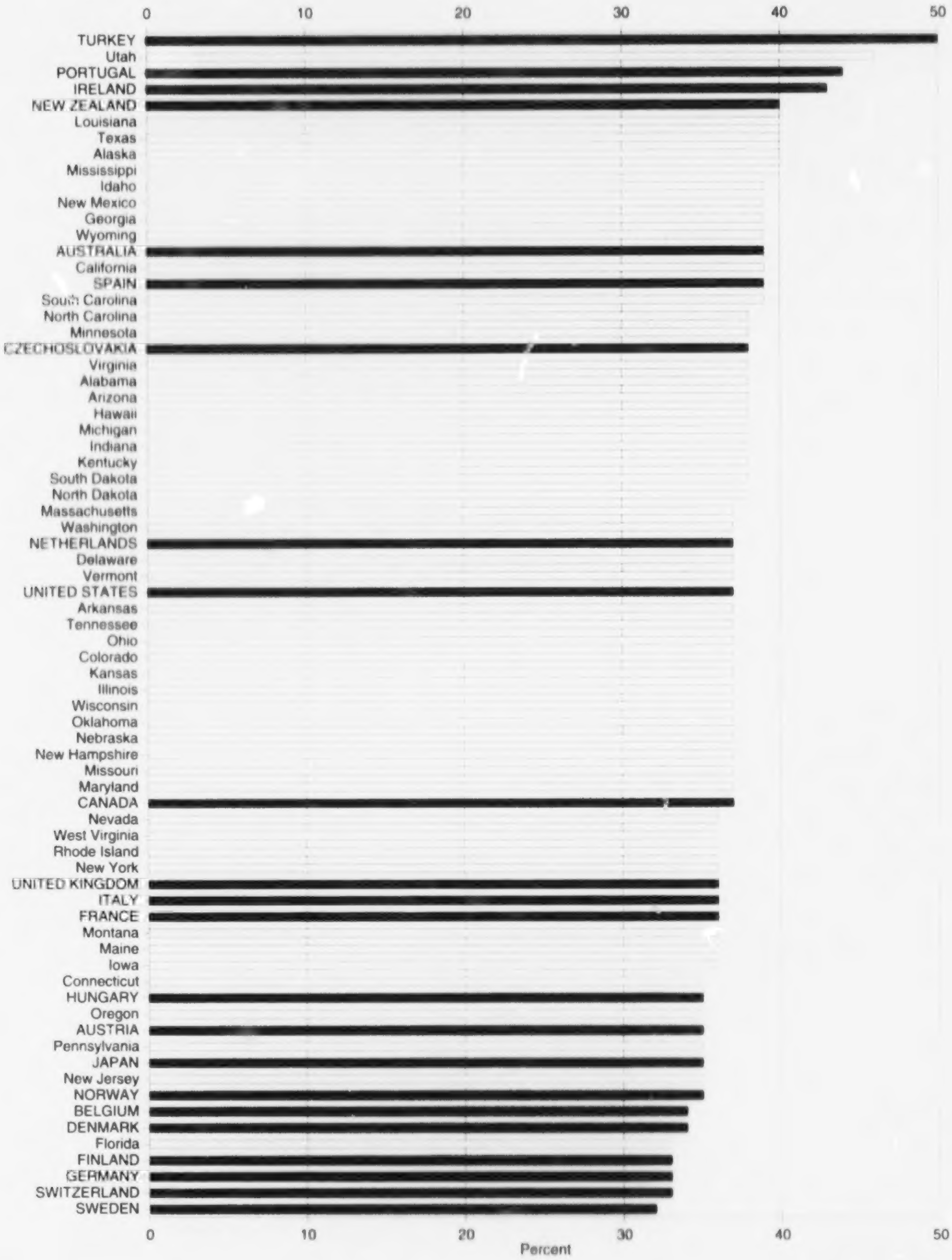
Indicator 2: Youth and population

The percentage of persons aged 5 to 29 is an indicator of the potential demand for school enrollments in a country or state. That percentage also is an indicator of the potential demand on national or state budgets for educational funding. The percentage is not an exact measure of the proportion of students in a population, however, since some persons within the age range of 5 to 29 will not be students and some students will be outside the age range. A relatively higher percentage of persons in the 5 to 14 age range may indicate both a higher current demand for educational services at the primary and lower secondary levels, as well as a future demand on the higher levels of education.

- **The United States and Canada had a larger proportion of young people in their population than did most OECD countries in 1991. Young people aged 5 to 29 comprised 37 percent of the population of the United States and Canada — 4 percentage points higher than in Germany, one of the countries with the lowest percentage of young people.**

- **U.S. states tended to have higher proportions of young people in their populations than did the OECD countries. Youth aged 5 to 29 comprised more than 35 percent of the population in 45 of the U.S. states, whereas only 12 of 22 other countries represented here recorded proportions that high.**

Figure 2: **Percentage of population aged 5 to 29, by country (1991) and state (1990)**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table C3. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table 2a: Percentage of population aged 5 to 29, by country: 1991

Country	Age groups in population			
	5–29	5–14	15–24	25–29
Australia	39	15	16	8
Austria	35	12	15	9
Belgium	34	12	14	8
Czechoslovakia	38	16	15	7
Canada	37	14	14	9
Denmark	34	11	15	8
Finland	33	13	13	8
France	36	13	15	8
Germany	33	11	13	9
Hungary	35	14	15	6
Ireland	43	19	17	7
Italy	36	12	16	8
Japan	35	13	15	7
Netherlands	37	12	16	9
New Zealand	40	15	16	8
Norway	35	12	15	8
Portugal	44	16	18	11
Spain	39	14	17	8
Sweden	32	11	14	7
Switzerland	33	11	14	8
Turkey	50	22	20	8
United Kingdom	36	13	15	8
United States	37	14	15	8

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table C3.

Table 2b: Percentage of population aged 5 to 29, by state: 1990

State	Age groups in population 5-29	5-14	15-24	25-29
Alabama	38	15	15	8
Alaska	40	17	14	9
Arizona	38	15	14	9
Arkansas	37	15	15	8
California	39	14	15	10
Colorado	37	15	14	9
Connecticut	35	12	14	9
Delaware	37	13	15	9
District of Columbia	37	10	17	10
Florida	33	12	13	8
Georgia	39	15	16	9
Hawaii	38	14	15	9
Idaho	39	18	14	7
Illinois	37	14	14	9
Indiana	38	15	15	8
Iowa	36	15	14	7
Kansas	37	15	14	8
Kentucky	38	15	15	8
Louisiana	40	17	15	8
Maine	36	14	14	8
Maryland	37	13	14	9
Massachusetts	37	12	15	9
Michigan	38	15	15	8
Minnesota	38	15	14	9
Mississippi	40	17	16	8
Missouri	37	14	14	8
Montana	36	16	13	7
Nebraska	37	15	14	8
Nevada	36	13	13	9
New Hampshire	37	14	14	9
New Jersey	35	13	14	9
New Mexico	39	17	14	8
New York	36	13	14	9
North Carolina	38	13	16	9
North Dakota	38	16	15	8
Ohio	37	14	15	8
Oklahoma	37	15	14	8
Oregon	35	14	13	7
Pennsylvania	35	13	14	8
Rhode Island	36	12	15	9
South Carolina	39	15	16	9
South Dakota	38	17	14	8
Tennessee	37	14	15	8
Texas	40	16	15	9
Utah	46	21	17	8
Vermont	37	14	16	8
Virginia	38	13	15	9
Washington	37	15	14	8
West Virginia	36	14	14	7
Wisconsin	37	15	14	8
Wyoming	39	18	13	8

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Indicator 3: Labor force participation

The labor force participation rate is the percentage of the total population aged 25 to 64 that is either employed or actively seeking work. Differences in participation rates between countries and states are the results of several factors, including (1) the percentage of the population enrolled full-time in education, (2) the number of people who have withdrawn from the labor force after being unable to find work, and (3) the continued prevalence in many societies of the tradition of women not working in order to care for their families.

- **Among the five G-7 countries in 1991 that are represented here, the United Kingdom had the highest labor force participation rate, 79 percent. The United States' and Canada's rate was 78 percent; Germany and France's, 75 percent. Two non-G-7 countries — Czechoslovakia and Sweden — had rates of 85 percent or higher.**

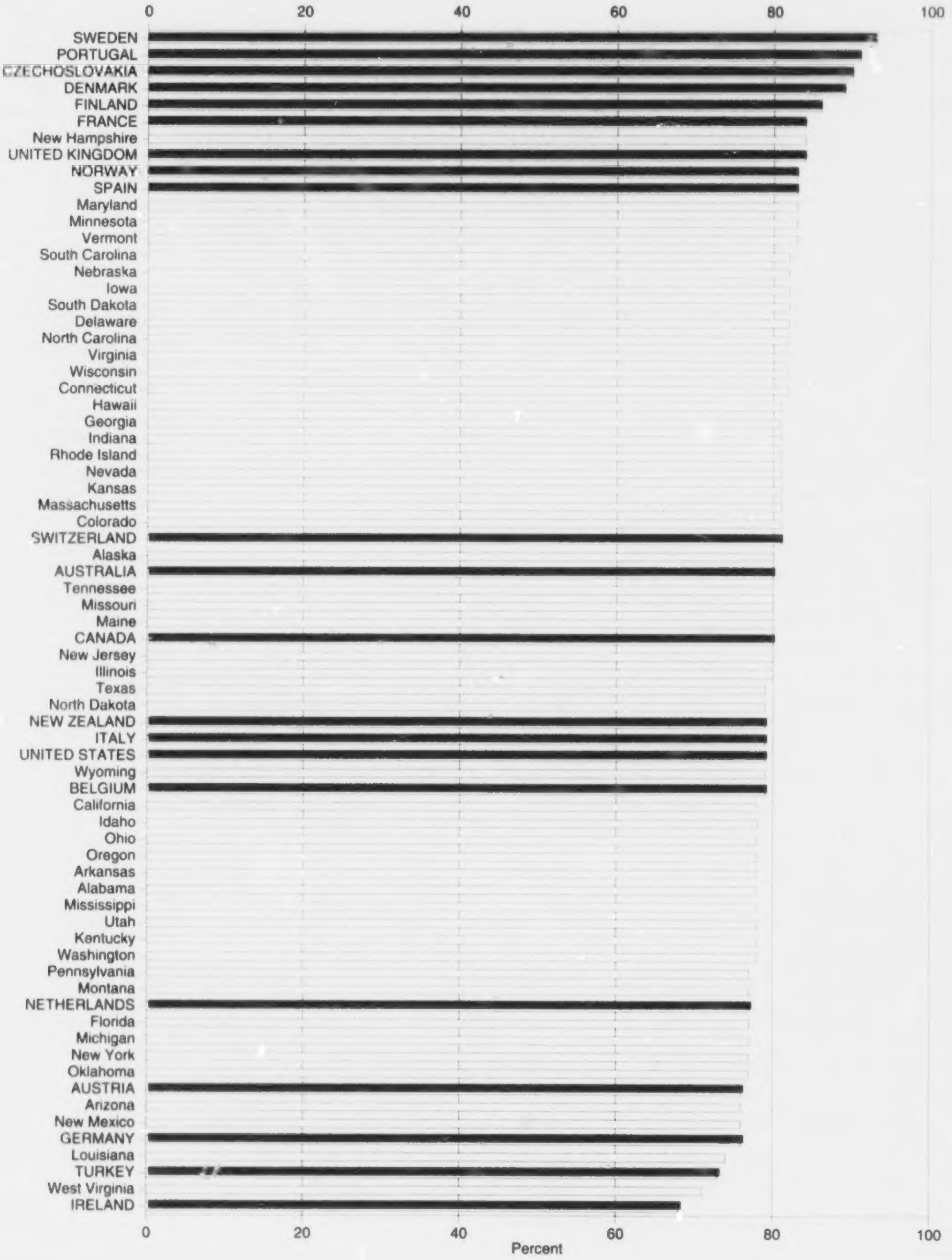
- **In all countries represented here, the labor force participation rate was higher for men than for women. The highest female participation rates (above 70 percent) and the smallest gaps between rates for men and women (below 15 percentage points) were in Czechoslovakia, Sweden, Finland, Denmark, and Norway. The United States, Canada, and the United Kingdom had the next highest rate for females, 69 percent, which was 20 percentage points lower than the rate for males in the United Kingdom, 19 percentage points lower in Canada, and 18 percentage points lower in the United States.**

- **The U.S. states tended to have higher total labor force participation rates than the countries. More than half of the countries had rates at or below 75 percent, whereas only seven states — Alabama, Arkansas, Kentucky, Louisiana, Mississippi, New Mexico, and West Virginia — did.**

- **As in all the countries, labor force participation rates in all the states were higher for men than for women. This difference was greater than 20 percentage points in 12 of the 20 other countries, whereas only 3 of the U.S. states recorded differences this large.**

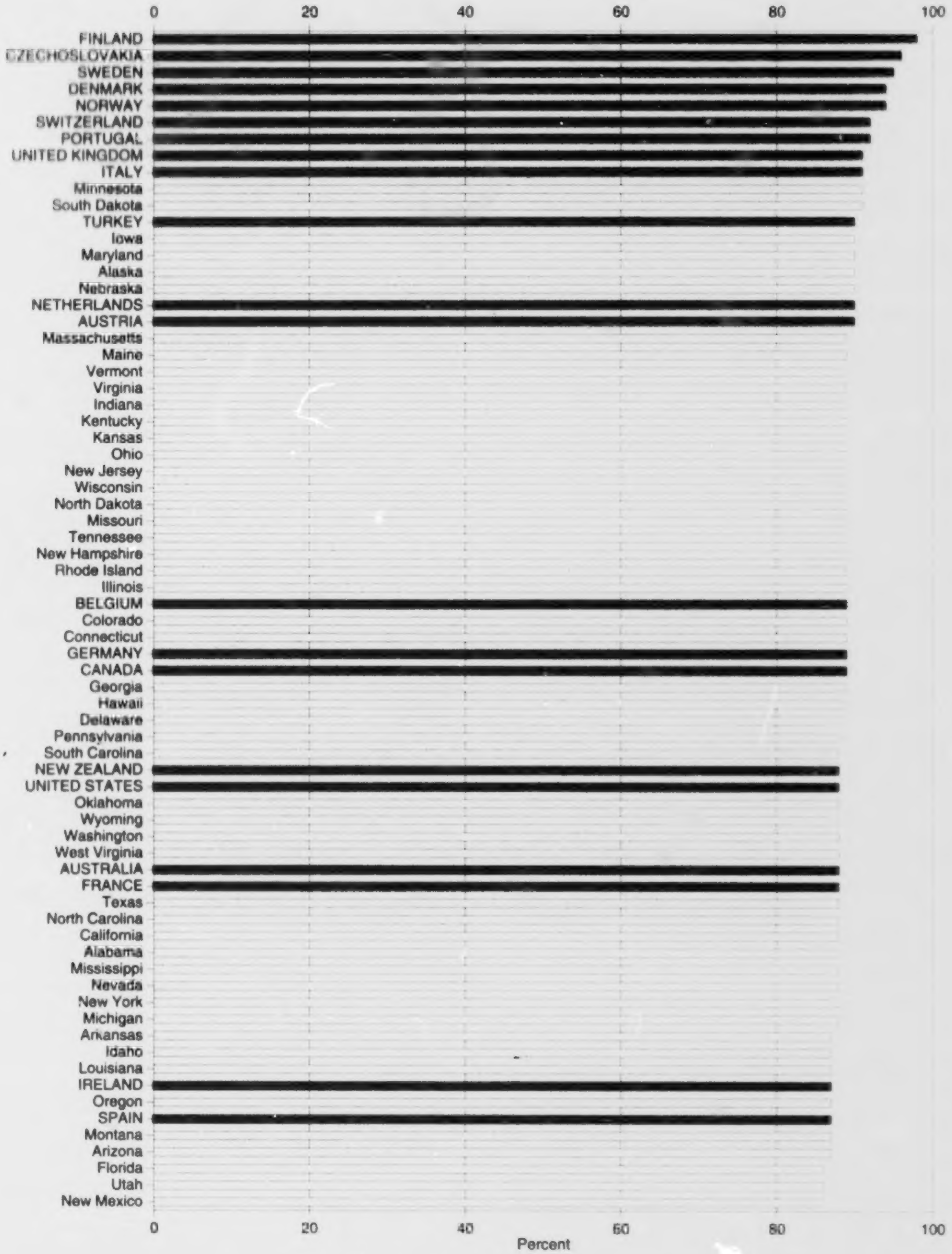
- **In all countries and all states, the labor force participation rate was higher among university graduates than among upper secondary school graduates. Likewise, the rate in all cases was higher among upper secondary school graduates than among those with less than an upper secondary degree.**

Figure 3a: Labor force participation rates for persons aged 25 to 64 whose highest level of educational attainment is upper secondary, by country (1991) and state (1990)



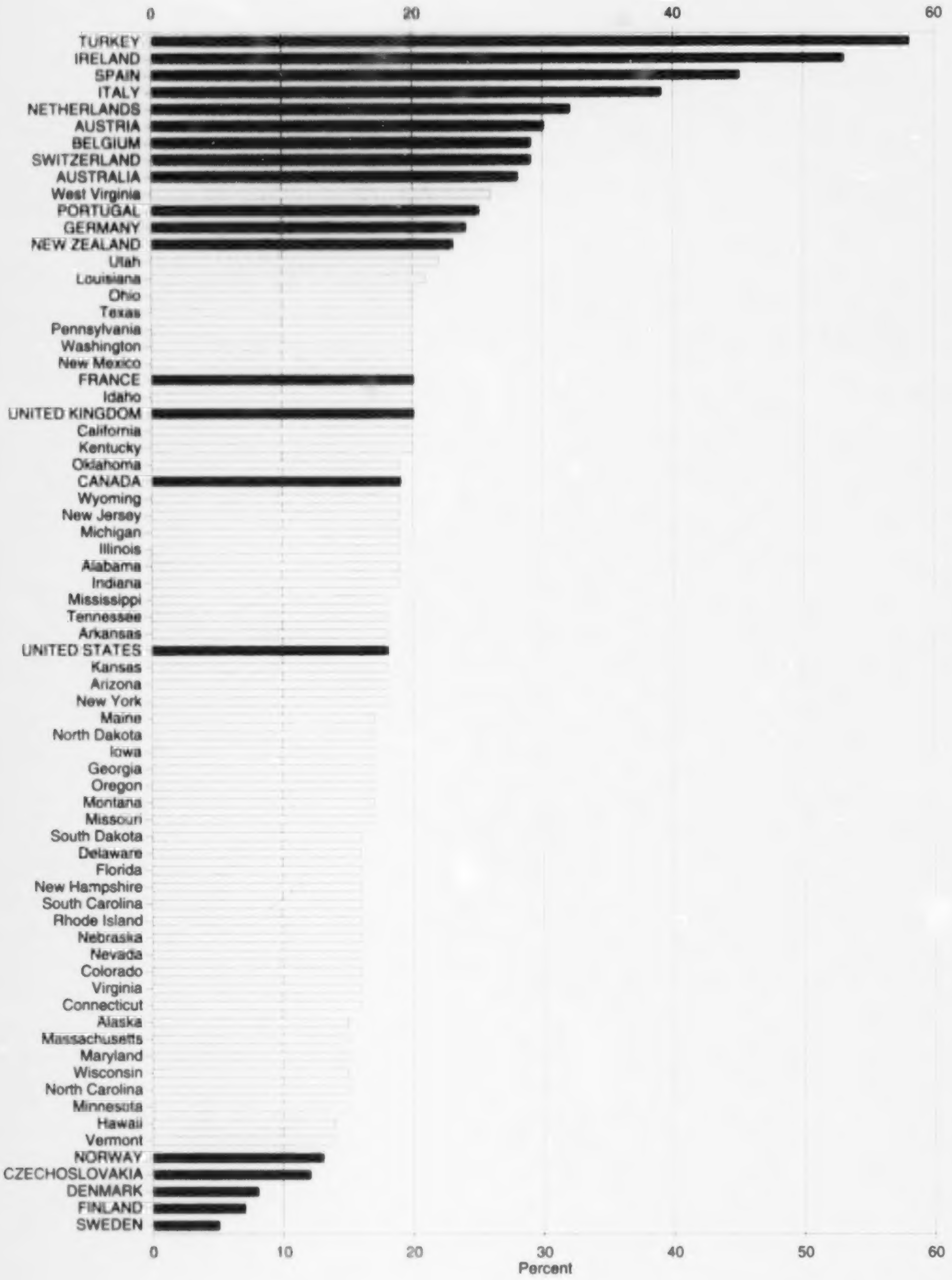
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table C5. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Figure 3b: Labor force participation rates for persons aged 25 to 64 having attained a university level of education, by country (1991) and state (1990)



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table C5. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Figure 3c: **Difference between male and female labor participation rates among those aged 25 to 64, by country (1991) and state (1990)**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table 3a: Labor force participation rate for persons aged 25 to 64, by level of educational attainment, sex, and country: 1991

Country	Less than upper secondary	Upper secondary	Higher education (non-university)	Higher education (university)	All levels of education		
					Total	Female	Male
Australia	58	80	76	88	70	56	84
Austria	54	76	—	90	70	55	85
Belgium	55	79	85	89	67	53	82
Czechoslovakia	67	90	—	96	85	79	91
Canada	61	80	86	89	78	69	88
Denmark	72	89	93	94	83	79	87
Finland	70	86	86	98	80	77	84
France	65	84	89	88	75	65	85
Germany	55	76	87	89	75	63	87
Ireland	58	68	81	87	64	38	91
Italy	57	79	—	91	64	45	84
Netherlands	55	77	84	90	69	53	85
New Zealand	68	79	81	88	75	64	87
Norway	67	83	90	94	82	75	88
Portugal	74	91	91	92	75	63	88
Spain	57	83	—	87	63	41	86
Sweden	85	93	95	95	91	89	94
Switzerland	72	81	92	92	82	67	96
Turkey	64	73	—	90	66	31	89
United Kingdom	68	84	86	91	79	69	89
United States*	62	79	85	88	78	69	87

— Persons are included in counts of another level of education.

*1990 data.

NOTE: See supplemental note to Indicator 3 on pp. 231–233 for a discussion of levels of education; on pp. 243–248 for details on data provided by Australia, Austria, Belgium, Canada, Czechoslovakia, Finland, France, Germany, Ireland, Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States, and for a discussion comparing U.S. educational attainment data from the Current Population Survey to the same in the 1990 Census.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population.

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Table 3b: Labor force participation rate for persons aged 25 to 64, by level of educational attainment, sex, and state: 1990

State	Less than upper secondary	Upper secondary	Higher education (non-university)	Higher education (university)	All levels of education		
					Total	Female	Male
Alabama	59	78	87	88	75	66	85
Alaska	62	80	85	90	80	73	88
Arizona	59	76	83	87	76	67	85
Arkansas	59	78	84	87	74	66	84
California	64	78	84	88	78	68	88
Colorado	65	81	87	89	82	74	90
Connecticut	68	82	86	89	83	75	91
Delaware	65	82	85	89	81	73	89
District of Columbia	62	80	86	90	80	77	83
Florida	64	77	84	86	77	69	85
Georgia	64	81	87	89	79	71	88
Hawaii	64	81	89	89	82	75	89
Idaho	65	78	84	87	78	68	88
Illinois	63	80	87	89	79	70	89
Indiana	62	81	88	89	79	70	89
Iowa	63	82	88	90	82	73	90
Kansas	64	81	87	89	81	72	90
Kentucky	53	78	85	89	73	63	83
Louisiana	53	74	83	87	71	61	82
Maine	61	80	87	89	79	71	88
Maryland	64	83	87	90	82	75	90
Massachusetts	65	81	86	89	82	74	89
Michigan	56	77	85	88	76	67	86
Minnesota	64	83	88	91	83	76	91
Mississippi	59	78	84	88	74	66	84
Missouri	60	80	86	89	78	70	87
Montana	60	77	85	87	77	69	86
Nebraska	67	82	88	90	82	75	91
Nevada	70	81	85	88	80	72	88
New Hampshire	71	84	88	89	84	76	92
New Jersey	66	80	84	89	81	71	90
New Mexico	55	76	83	86	74	64	84
New York	59	77	85	88	77	68	86
North Carolina	67	82	88	88	80	73	88
North Dakota	64	79	87	89	80	72	89
Ohio	56	78	86	89	76	67	87
Oklahoma	58	77	84	88	76	67	86
Oregon	64	78	84	87	78	70	87
Pennsylvania	58	77	85	88	76	67	87
Rhode Island	68	81	88	89	81	73	89
South Carolina	65	82	88	88	78	70	86
South Dakota	67	82	87	91	82	74	90
Tennessee	60	80	86	89	76	68	86
Texas	63	79	85	88	78	68	88
Utah	65	78	83	86	79	68	90
Vermont	67	83	87	89	82	76	90
Virginia	65	82	87	89	81	73	89
Washington	61	78	84	88	79	69	89
West Virginia	45	71	82	88	67	54	80
Wisconsin	64	82	90	89	81	74	89
Wyoming	66	79	85	88	79	70	89

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Indicator 4: GDP/GSP per capita

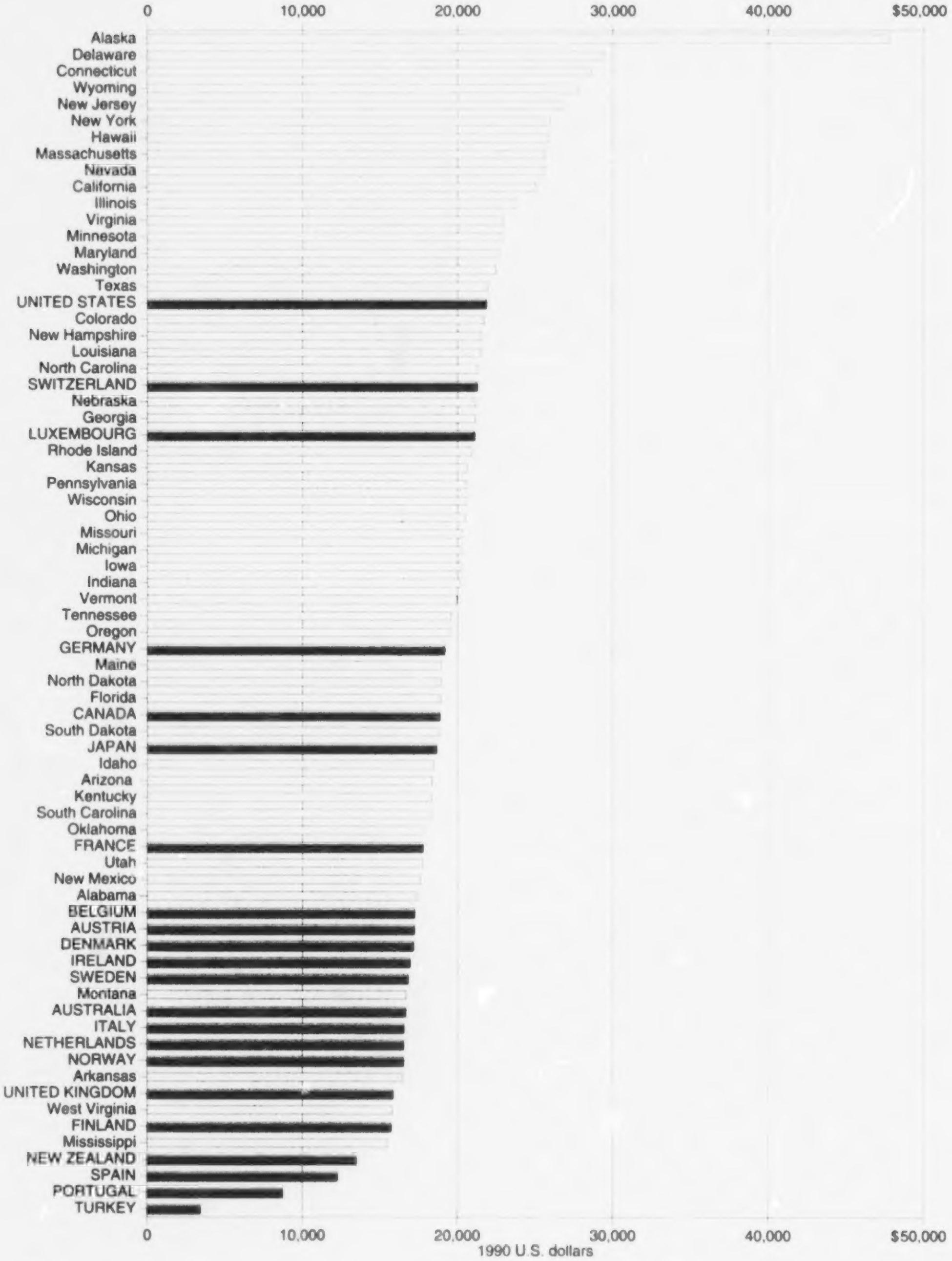
Gross domestic product (GDP) is an aggregate measure of the value of goods and services produced in a country. Gross state product (GSP) is the analogous measure for U.S. states. Gross product is a measure of a country's or state's productive capacity or wealth. Countries or states with equal GDP/GSPs can have very different numbers of inhabitants, however. GDP/GSP *per capita* provides a measure of the resources available to a country or state relative to the size of its population. Countries or states with large gross products per capita generally are better able to provide educational services for their residents.

- **Among the G-7 nations, the United States had the highest GDP per capita in 1991, $21,826 — over $2,600 more than Germany, about $3,000 more than Canada or Japan, and at least $4,000 more than France, Italy, or the United Kingdom.**

- **The U.S. states generally had higher gross products per capita than the OECD nations. Twelve of the other 21 OECD nations reported GDPs per capita below $17,000, whereas only four states — Mississippi, West Virginia, Arkansas, and Montana — had per capita GSPs below that level.**

- **Ten U.S. states — Alaska, Delaware, Connecticut, Wyoming, New Jersey, New York, Hawaii, Massachusetts, Nevada, and California — had GSPs per capita of $25,000 or above. None of the other OECD nations had GDPs per capita higher than $22,000.**

Figure 4: GSP/GDP per capita, by country and state: 1991



NOTE: 1991 GSPs estimated from 1990 data.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance 1993*, Table C7. U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, December 1993; Bureau of the Census, *Statistical Abstract of the United States*, 1992, Table 25.

Table 4a: GDP per capita (in U.S. dollars), by country: 1991

Country	GDP per capita*
Australia	$16,655
Austria	17,214
Belgium	17,220
Canada	18,832
Denmark	17,142
Finland	15,718
France	17,763
Germany	19,147
Ireland	16,918
Italy	16,543
Japan	18,634
Luxembourg	21,075
Netherlands	16,524
New Zealand	13,483
Norway	16,517
Portugal	8,716
Spain	12,250
Sweden	16,805
Switzerland	21,237
Turkey	3,426
United Kingdom	15,845
United States	21,826

*1990 U.S. dollars.

NOTE: See supplemental note to Indicator 4 on p. 249 for details on data provided by Australia, Canada, Finland, Japan, New Zealand, Sweden, the United Kingdom, and the United States, and for a definition of gross domestic product and a technical note on estimation of 1991 gross products.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table C7.

Table 4b: GSP per capita, by state: 1991

State	GSP per capita
Alabama	$17,408
Alaska	47,764
Arizona	18,353
Arkansas	16,477
California	25,024
Colorado	21,697
Connecticut	28,570
Delaware	29,471
District of Columbia	60,058
Florida	18,907
Georgia	21,129
Hawaii	25,856
Idaho	18,426
Illinois	23,812
Indiana	20,175
Iowa	20,201
Kansas	20,626
Kentucky	18,315
Louisiana	21,536
Maine	18,947
Maryland	22,709
Massachusetts	25,586
Michigan	20,230
Minnesota	22,858
Mississippi	15,476
Missouri	20,261
Montana	16,685
Nebraska	21,150
Nevada	25,581
New Hampshire	21,537
New Jersey	26,963
New Mexico	17,615
New York	25,949
North Carolina	21,293
North Dakota	18,915
Ohio	20,478
Oklahoma	17,806
Oregon	19,502
Pennsylvania	20,589
Rhode Island	20,915
South Carolina	18,284
South Dakota	18,790
Tennessee	19,571
Texas	21,898
Utah	17,761
Vermont	19,943
Virginia	22,896
Washington	22,470
West Virginia	15,790
Wisconsin	20,568
Wyoming	27,740

NOTE: 1991 GSPs are estimated from 1990 data and are in 1990 U.S. dollars.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, December 1993; Bureau of the Census, *Statistical Abstract of the United States*: 1992, Table 25.

Indicator 5: Percentage of population age 17 years or younger in poverty

The economic conditions of children's lives can affect their performance in school. Poor children may not have a nutritionally-adequate diet, and so may be less alert during class. They also may have less free time in which to study because they must work to earn extra income for their family. They may live in a home environment not conducive to study — crowded and noisy, perhaps — with few books or other materials that promote learning. Thus, poor children may come to school every day less prepared to learn than other children. "Children" are defined here as all those 17 years of age or younger.

- **The child poverty rate in the United States in 1991 was highest among the countries for which data are available and more than double the rate for 13 of the 17 other countries, as measured in various years from the mid-1980s to the early-1990s.**

- **Of the 17 other countries represented here, only 4 had child poverty rates above 10 percent, whereas all the U.S. states but New Hampshire had rates that high.**

Notes on interpretation:

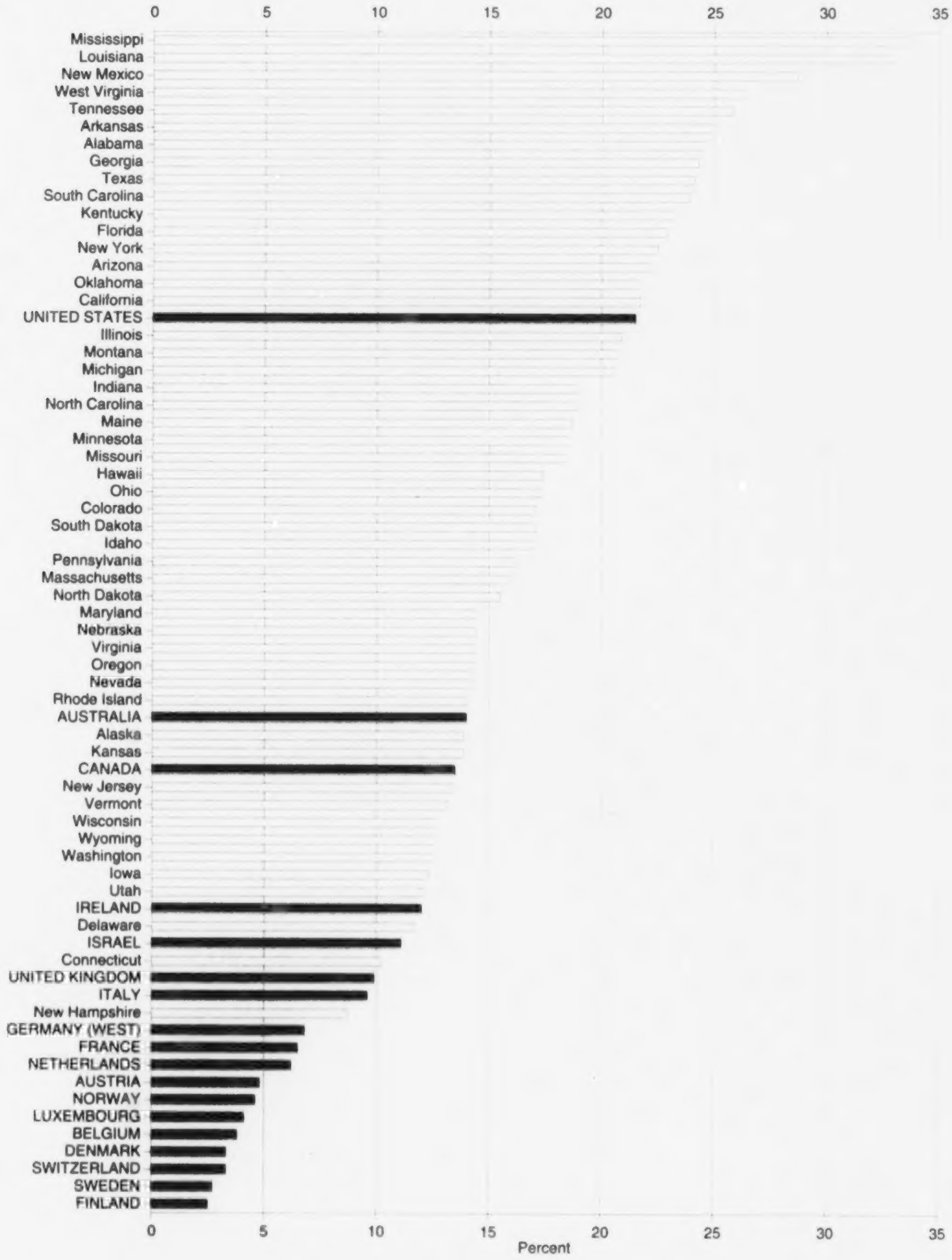
The poverty threshold used here is the U.S. standard — 40 percent of the median income — and other countries' data are adapted to it. All households with incomes below the threshold are classified as poor, as are any children living in these households. The percentage of children in poverty, then, is the percentage of all children who are classified as poor. However, this measure should not be generalized to infer poverty rates for demographic groups other than children.

These poverty rates are measured *after taxes and transfers*; that is, they account for the effect of taxes and of governmental aid programs to the poor. Poverty rates also can be measured *before taxes and transfers*, in which case the effect of the government aid programs are not accounted for. Poverty rates before taxes and transfers primarily reflect people's job income, and ignore benefits from government transfer programs, such as (in the United States) social security, AFDC; food stamps, and Medicaid payments. Some other countries' child poverty rates are close to the U.S. rate before transfers; but the effect of government aid programs to the poor sets them apart after transfers. On average, European governments provide more generous transfer payments to their poor.

The poverty rate used here is a relative, rather than an absolute, measure of poverty. A household below the poverty threshold (of 40 percent of the median income level) in a relatively wealthy country could actually be wealthier than a household above the poverty threshold in a relatively poor country, where the median income level is lower. Taking that into consideration, this poverty measure is more a measure of the *range* of the income distribution in a country or state than it is of well-being or purchasing power. Government transfer programs to the poor usually have the effect of truncating the bottom end of the income distribution at a level deemed to be sufficient for a minimally acceptable standard of living.

The poverty rate used here is not adjusted for relative costs-of-living with a purchasing power parity index or other index of adjustment. Poverty rates may be higher in locations where the costs-of-living are lower and thus, one could argue, the real effect of lower income is less onerous.

Figure 5: Percentage of population age 17 years or younger in poverty, by country and state: Various years



SOURCE: Timothy M. Smeeding and Lee Rainwater, Luxembourg Income Study; The Annie E. Casey Foundation and the Center for the Study of Social Policy, *Kids Count Data Book*, 1994, Appendix 2 (based on U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March, 1991).

Table 5a: Percentage of population age 17 years or younger in poverty: Various years

Country	Year	Total
Australia	1990	14.0
Austria	1987	4.8
Belgium	1992	3.8
Canada	1991	13.5
Denmark	1991	3.3
Finland	1991	2.5
France	1984	6.5
Germany (West)	1989	6.8
Ireland	1987	12.0
Israel	1986	11.1
Italy	1991	9.6
Luxembourg	1985	4.1
Netherlands	1991	6.2
Norway	1991	4.6
Sweden	1992	2.7
Switzerland	1982	3.3
United Kingdom	1986	9.9
United States	1991	21.5

NOTE: See supplemental note to Indicator 5 on p. 250 for a discussion of definitions used in this indicator.

SOURCE: Timothy M. Smeeding and Lee Rainwater, Luxembourg Income Study.

Table 5b: Percentage of population age 17 years or younger in poverty, by state: 1991

State	Total
Alabama	24.6
Alaska	13.9
Arizona	22.1
Arkansas	24.9
California	21.7
Colorado	17.1
Connecticut	10.2
Delaware	11.7
District of Columbia	29.5
Florida	22.9
Georgia	24.3
Hawaii	17.4
Idaho	17.0
Illinois	20.9
Indiana	18.9
Iowa	12.3
Kansas	13.9
Kentucky	23.2
Louisiana	32.8
Maine	18.7
Maryland	14.5
Massachusetts	15.9
Michigan	20.5
Minnesota	18.5
Mississippi	33.9
Missouri	18.4
Montana	20.7
Nebraska	14.4
Nevada	14.2
New Hampshire	8.7
New Jersey	13.4
New Mexico	28.7
New York	22.5
North Carolina	18.9
North Dakota	15.5
Ohio	17.3
Oklahoma	21.7
Oregon	14.3
Pennsylvania	16.2
Rhode Island	14.0
South Carolina	23.9
South Dakota	17.1
Tennessee	25.8
Texas	24.1
Utah	12.1
Vermont	13.2
Virginia	14.4
Washington	12.5
West Virginia	26.4
Wisconsin	12.7
Wyoming	12.6

SOURCE: The Annie E. Casey Foundation and the Center for the Study of Social Policy, *Kids Count Data Book*, 1994, Appendix 2 (based on U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March 1991).

Indicator 6: Births to teen mothers

Births to teen mothers are represented here by the percentage of all live births in a country or state that occur to women aged 15 to 19. This percentage represents a proportion of the cohort of infants likely born into an environment of disadvantage. Teen mothers tend to have fewer resources than older mothers because they have had less time in which to accumulate savings or build up their own productive capacity through work experience, education, or training. Moreover, while most mothers can draw upon the additional resources of fathers, teen fathers tend to be plagued by the same paucity of resources as are teen mothers. Teen fathers are also less likely than older fathers to legally commit themselves to supporting the family. Indeed, in the European Community as a whole and in the United States, a majority of teen mothers are not married. With a baby to care for, a teen is also less likely to complete secondary school or to go on to higher education, thus further limiting economic opportunities.

- **Births to teen mothers in 1990 ranged from less than 2 percent of all births in the Netherlands to 8.5 percent in Portugal. Three countries — Portugal, the United Kingdom, and Greece (at 8.5 percent, 7.9 percent, and 7.1 percent, respectively) — reported higher percentages of teen births than did the United States (at 6.0 percent).**

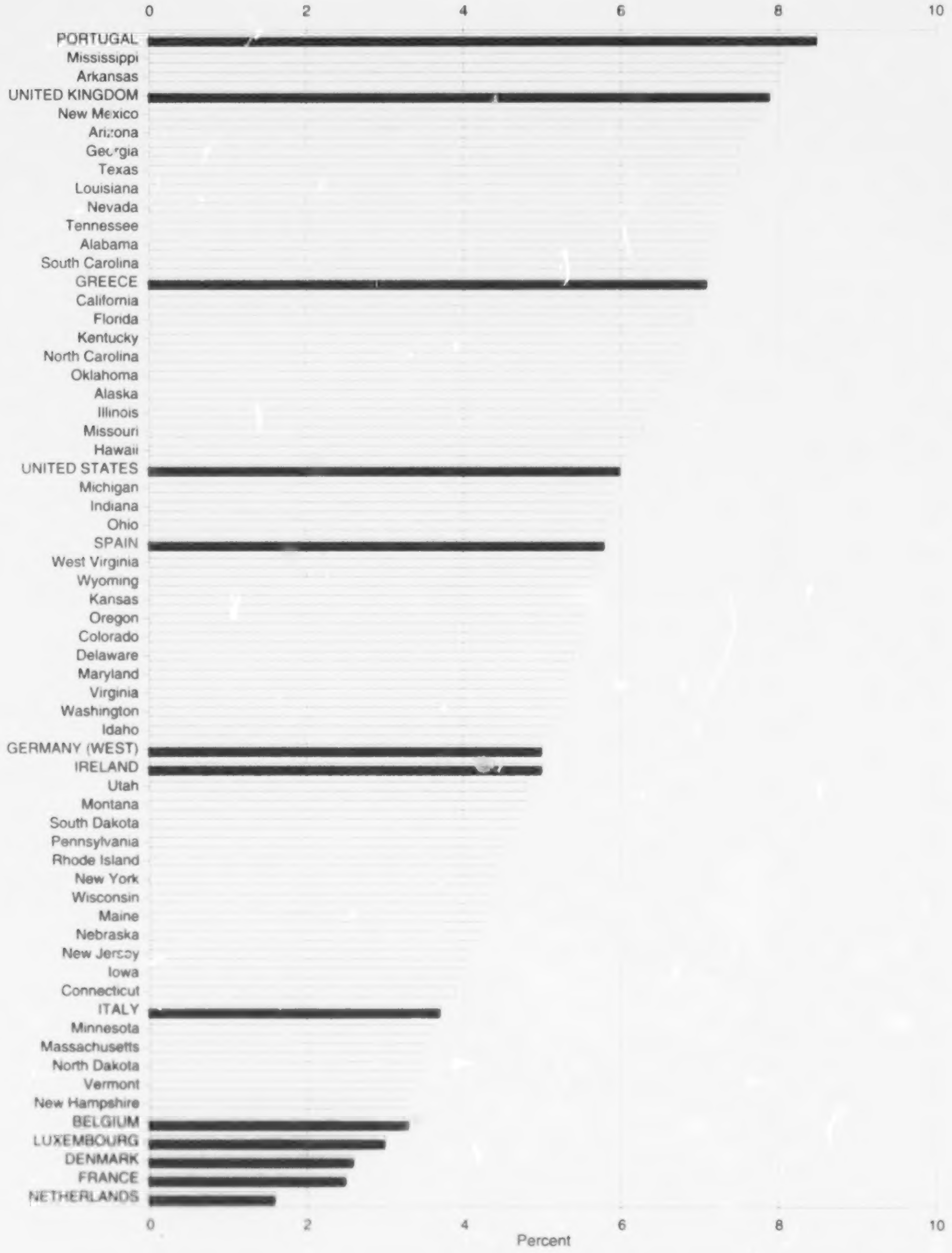
- **There were five countries — Belgium, Luxembourg, Denmark, France, and the Netherlands — whose percentages of teen births were equal to or lower than that of New Hampshire, the state with the lowest percentage (3.3).**

- **In 30 states, fewer than 6 percent of births were to teen mothers. This was also the case in 9 of the 12 European countries for which data are available.**

Note on interpretation:

A number of teens aged 14 and younger in all the countries represented here do become mothers. But, the proportion of teen mothers aged 14 and younger in all countries is exceedingly small. It is possible that 14-year-old mothers were responsible for as many as 1.1 percent of births in Portugal in 1990. In all other European Community countries reporting age-specific fertility data, that percentage was well below 1.

Figure 6: Births to teen mothers aged 15 to 19 as a percentage of all births, by country and state: 1990



SOURCE: Statistical Office of the European Communities, *Demographic Statistics, 1992*, Table E-6. Child Trends, Inc., *Facts At A Glance*, March, 1993, Annual Newsletter on Teen Pregnancy (based on U.S. Department of Health and Human Services, National Center for Health Statistics, *Vital Statistics for the United States, 1990, Vol 1, Natality)*.

Table 6a: Births to teen mothers aged 15 to 19 as a percentage of all births, by country: 1990

Country	Percent
Belgium[1]	3.3
Denmark	2.6
France	2.5
Germany (West)	5.0
Greece	7.1
Ireland	5.0
Italy[2]	3.7
Luxembourg	3.0
Netherlands	1.6
Portugal	8.5
Spain[2]	5.8
United Kingdom	7.9
United States	6.0

[1] 1987 data.
[2] 1988 data.

NOTE: See supplemental note to Indicator 6 on p. 250 for details on data provided by European Community countries and on this indicator's calculation.

SOURCE: Statistical Office of the European Communities, *Demographic Statistics, 1992*, Table E-6.

Table 6b: Births to teen mothers aged 15 to 19 as a percentage of all births, by state: 1990

State	Percent
Alabama	7.1
Alaska	6.5
Arizona	7.6
Arkansas	8.0
California	7.1
Colorado	5.5
Connecticut	3.9
Delaware	5.4
District of Columbia	9.3
Florida	6.9
Georgia	7.5
Hawaii	6.1
Idaho	5.1
Illinois	6.3
Indiana	5.9
Iowa	4.0
Kansas	5.6
Kentucky	6.8
Louisiana	7.4
Maine	4.3
Maryland	5.3
Massachusetts	3.5
Michigan	5.9
Minnesota	3.6
Mississippi	8.1
Missouri	6.3
Montana	4.8
Nebraska	4.2
Nevada	7.3
New Hampshire	3.3
New Jersey	4.1
New Mexico	7.8
New York	4.4
North Carolina	6.8
North Dakota	3.5
Ohio	5.8
Oklahoma	6.7
Oregon	5.5
Pennsylvania	4.5
Rhode Island	4.4
South Carolina	7.1
South Dakota	4.7
Tennessee	7.2
Texas	7.5
Utah	4.8
Vermont	3.4
Virginia	5.3
Washington	5.3
West Virginia	5.7
Wisconsin	4.3
Wyoming	5.6

SOURCE: Child Trends, Inc., *Facts At A Glance*, March 1993, Annual Newsletter on Teen Pregnancy (based on U.S. Department of Health and Human Services, National Center for Health Statistics, *Vital Statistics of the United States, 1990, Vol. 1, Natality*).

Indicator 7: Youth violent death rate

Demographers classify deaths by accident, suicide, or homicide collectively as "violent deaths." The three different types of violent death are rather different from one another in their character and societal implications, however. Homicide, for example, results from the violent behavior of one individual toward another, creating a social environment of danger. While suicide may be another way some individuals respond to social alienation or stress, it does not create a social environment of danger. The *youth* violent death rate is measured here by the number of deaths by accident, suicide, or homicide among young people aged 5 to 24 in a country or state. Some homicides and suicides may get misclassified as accidental deaths or "other"; perhaps deliberately so in some societies. A high youth violent death rate suggests that a society's youth bear the burden of problems that compete with the schools for their attention. Moreover, youth suicide and homicide may represent only the most extreme responses to larger and deeper social problems among a state's or nation's youth.

- **Of the G-7 countries, in the late 1980s the United States had the highest overall violent death rate (481 per 1,000,000 youths), a rate more than twice as high as those of Japan, Italy, and the United Kingdom (207, 232, and 235, respectively) and almost 30 percent higher than that of Canada, the G-7 country with the second highest rate (378). The United States was the leader in accidents (315) and homicides (86), and was third after East Germany and Canada in suicides (72, 142, and 88, respectively). The United States' youth homicide rate was over 20 times higher than that of Japan, the G-7 country with the lowest homicide rate (4), and over 6 times higher than that of Canada, the G-7 nation with the second highest homicide rate (13).**

- **Colombia was the only country with a homicide rate over 100, with 208 per 1,000,000 youths. Nine of the U.S. states recorded homicide rates higher than 100. Seventeen of the thirty countries, however, maintained youth homicide rates below 10, which none of the U.S. states did.**

- **For 25 of the 30 countries represented here, the number of suicides exceeded the number of homicides among youths. The United States, however, was one of the 5 countries in which the relationship was the reverse.**

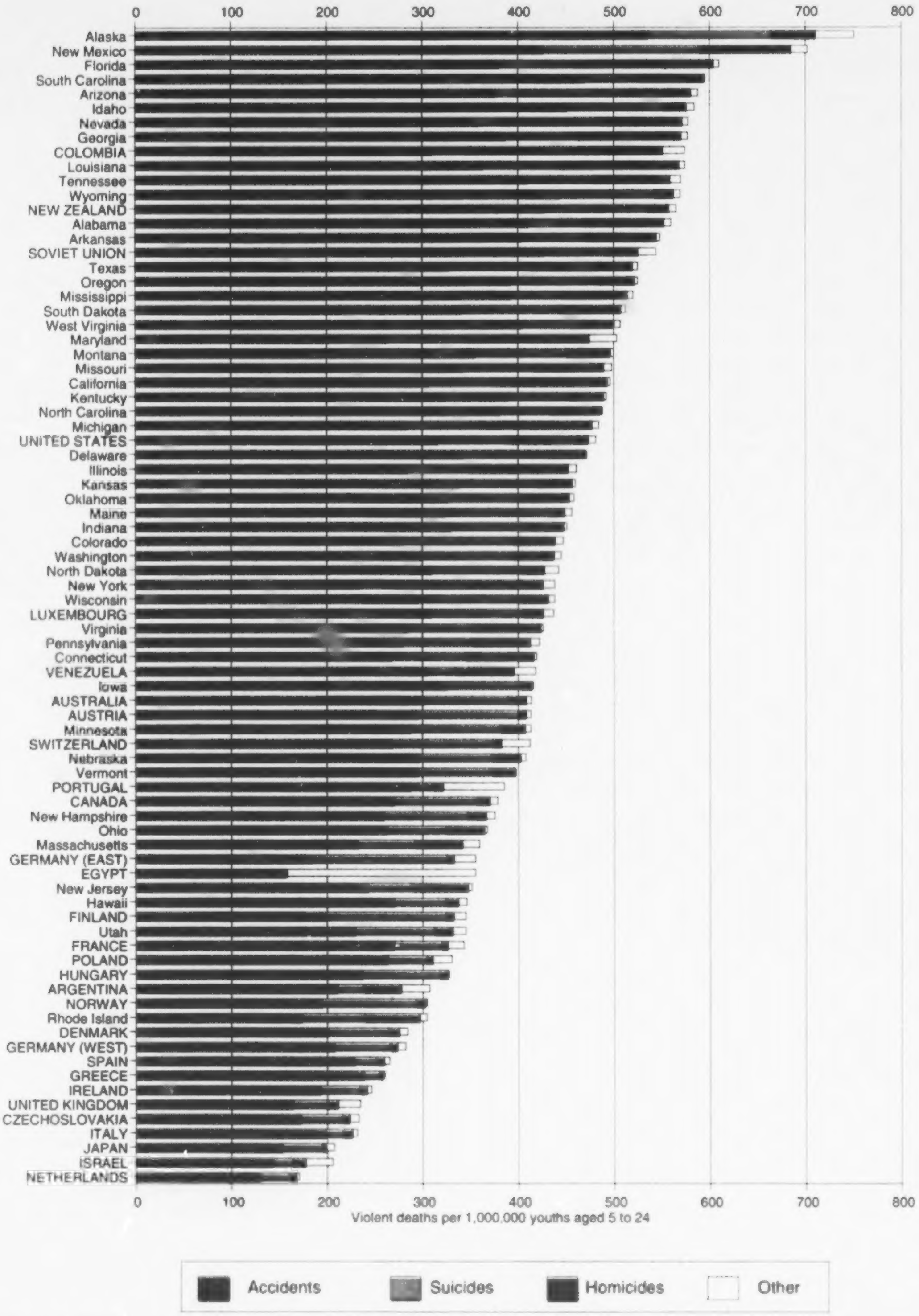
- **New York and New Jersey were the only 2 states with suicide rates lower than 50 per 1,000,000 youths. Half of the countries had suicide rates this low.**

Notes on interpretation:

Societies vary in their tolerance of the act of suicide. Some societies are more likely than others to judge that suicide represents justifiable behavior in certain circumstances; or, looked at another way, they may be less likely to condemn it without reservation.

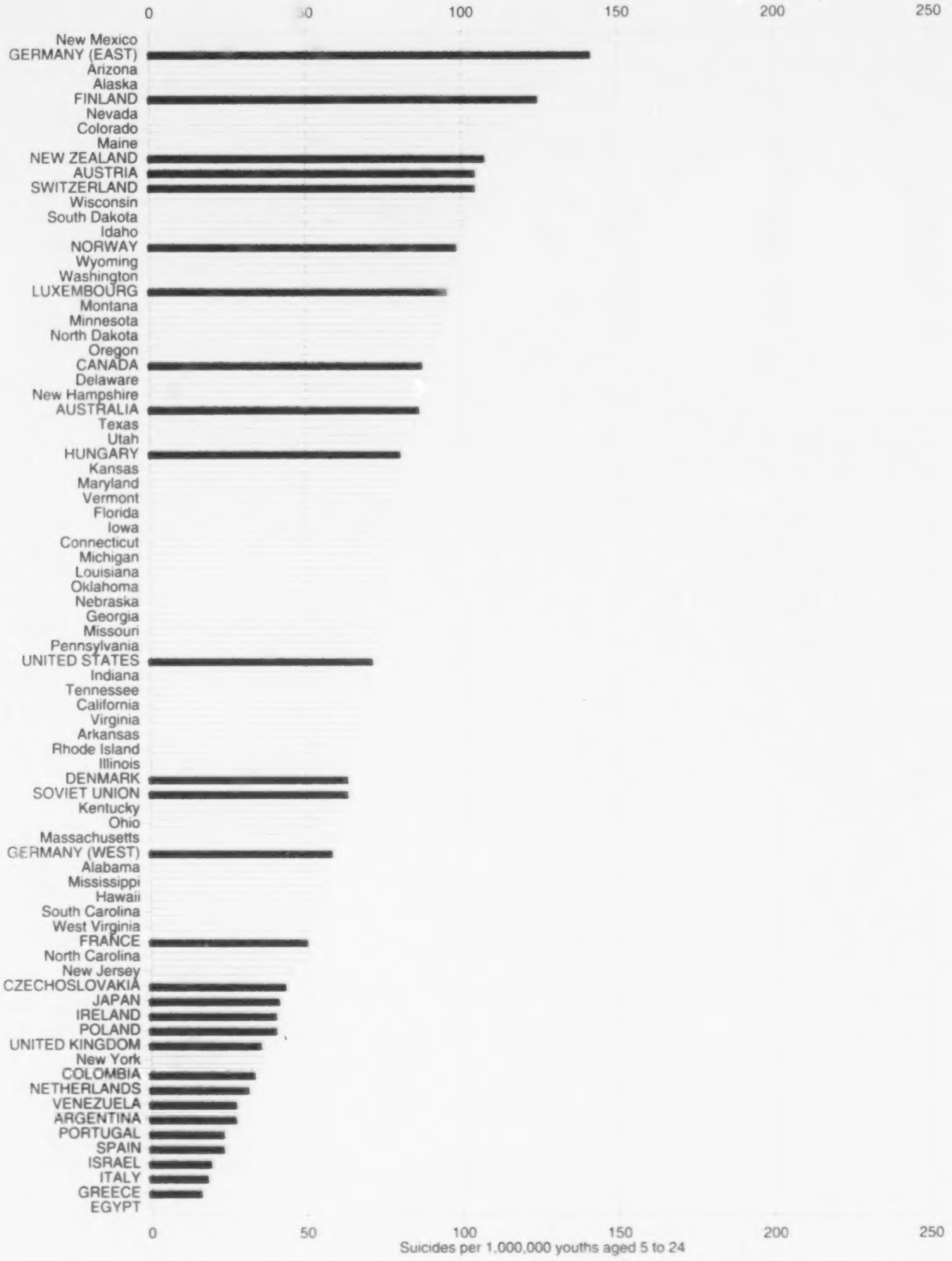
Countries also vary in their level of development in forensic science. Some countries are better able to precisely determine cause of death than others. To some degree, countries may show higher levels of suicide and homicide because they are better able to detect them. But countries and states also vary in the availability of critical care medical services. To some degree, countries or states may show higher levels of violent death because critical care medical services are not as available as in other countries or states. Critical care medical services are especially difficult to provide in predominantly rural countries or states where the population is dispersed over a wide area.

Figure 7a: Violent deaths per 1,000,000 youths aged 5 to 24, by type of death, country and state: Various years



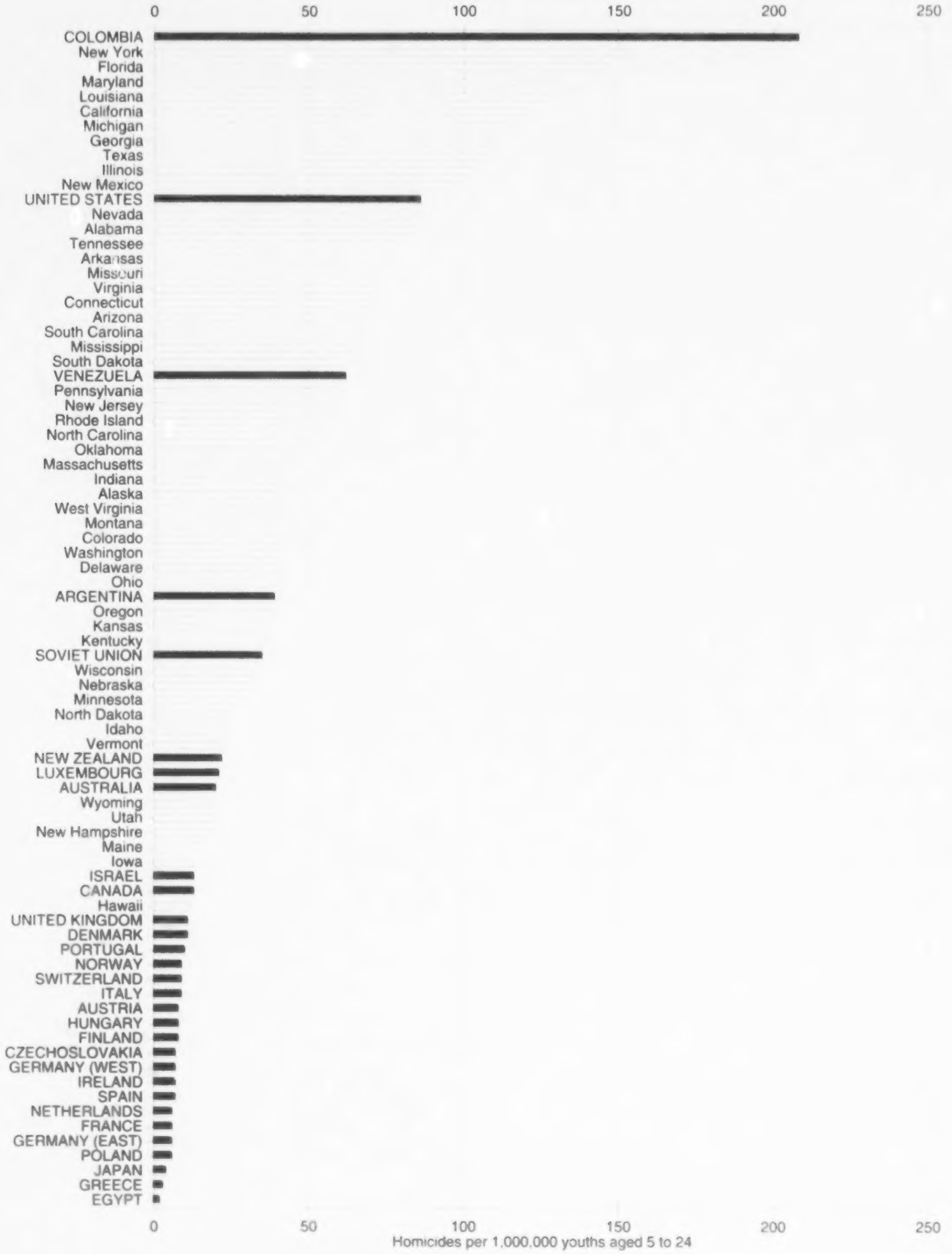
SOURCE: World Health Organization, *World Health Statistics Annual, 1990*, Section D, Table 9. U.S. Department of Health and Human Services, *Vital Statistics of the United States, 1988, Volume 2* – Mortality, Part B, Table 8-6.

Figure 7b: **Suicides per 1,000,000 youths aged 5 to 24, by country and state: Various years**



SOURCE: World Health Organization, *World Health Statistics Annual, 1990*, Section D, Table 9. U.S. Department of Health and Human Services *Vital Statistics of the United States, 1988, Volume 2 – Mortality*, Part B, Table 8-6.

Figure 7c: Homicides per 1,000,000 youths aged 5 to 24, by country and state: Various years



SOURCE: World Health Organization, *World Health Statistics Annual, 1990*, Section D, Table 9. U.S. Department of Health and Human Services, *Vital Statistics of the United States, 1988, Volume 2 – Mortality*, Part B, Table 8-6.

Table 7a: Violent deaths per 1,000,000 youths aged 5 to 24, by type of death and country: Various years

Country	Year	Total	Accidents	Suicides	Homicides	Other
Argentina	1986	307	210	28	39	30
Australia	1988	415	301	87	20	6
Austria	1989	414	295	105	8	5
Canada	1988	378	269	88	13	8
Colombia	1984	575	309	34	208	23
Czechoslovakia	1989	232	172	44	7	10
Denmark	1988	284	200	64	11	9
Egypt	1987	356	156	0	2	197
Finland	1988	345	199	125	8	13
France	1988	342	269	51	6	17
Germany (East)	1989	355	184	142	6	23
Germany (West)	1989	281	207	59	7	9
Greece	1987	261	238	17	3	2
Hungary	1989	328	237	81	8	1
Ireland	1988	246	193	41	7	5
Israel	1987	205	144	20	13	29
Italy	1987	232	198	19	9	5
Japan	1989	207	153	42	4	8
Luxembourg	1989	436	309	96	21	11
Netherlands	1988	171	129	32	6	3
New Zealand	1987	565	427	108	22	8
Norway	1988	305	194	99	9	2
Poland	1989	331	263	41	6	20
Portugal	1989	386	287	24	10	64
Soviet Union	1988	544	426	64	35	19
Spain	1986	264	228	24	7	6
Switzerland	1989	412	268	105	9	30
United Kingdom	1989	235	164	36	11	23
United States	1988	481	315	72	86	8
Venezuela	1987	417	305	28	62	23

NOTE: See supplemental note to Indicator 7 on p. 251 for details on this indicator's calculation and on the data collected by the World Health Organization.

SOURCE: World Health Organization, *World Health Statistics Annual, 1990,* Section D, Table 9.

Table 7b: Violent deaths per 1,000,000 youths aged 5 to 24, by type of death and state: 1988

State	Total	Accidents	Suicides	Homicides	Other
Alabama	560	411	56	85	8
Alaska	750	535	128	47	41
Arizona	589	378	132	70	8
Arkansas	548	403	66	75	4
California	495	305	67	121	3
Colorado	448	279	115	44	9
Connecticut	420	267	77	72	3
Delaware	472	342	88	41	0
District of Columbia	1,064	224	38	776	26
Florida	610	380	77	147	6
Georgia	577	386	75	109	7
Hawaii	347	270	55	12	9
Idaho	584	450	101	24	9
Illinois	460	284	64	104	9
Indiana	451	329	70	48	4
Iowa	416	324	77	13	1
Kansas	461	338	81	37	4
Kentucky	493	388	64	37	3
Louisiana	574	363	76	129	6
Maine	456	323	108	17	8
Maryland	503	263	80	131	29
Massachusetts	360	232	60	49	18
Michigan	484	284	76	117	7
Minnesota	413	287	94	26	6
Mississippi	519	392	56	66	6
Missouri	498	342	74	73	9
Montana	500	354	96	46	4
Nebraska	408	296	76	30	6
Nevada	577	361	124	86	7
New Hampshire	375	259	88	19	9
New Jersey	352	243	45	59	4
New Mexico	701	426	163	96	17
New York	439	234	36	155	13
North Carolina	488	381	51	54	2
North Dakota	441	309	93	25	15
Ohio	367	263	61	40	3
Oklahoma	457	327	76	50	5
Oregon	525	392	91	38	4
Pennsylvania	423	279	73	60	10
Rhode Island	304	174	65	58	7
South Carolina	595	469	54	70	2
South Dakota	512	340	102	65	5
Tennessee	571	410	69	79	12
Texas	525	327	85	107	6
Utah	345	229	83	19	14
Vermont	398	295	78	24	0
Virginia	425	284	67	72	3
Washington	445	298	97	42	8
West Virginia	507	403	51	46	7
Wisconsin	438	296	104	31	7
Wyoming	569	444	98	20	7

SOURCE: U.S. Department of Health and Human Services, National Center for Health Statistics, *Vital Statistics of the United States, 1988, Volume 2 – Mortality*, Part B, Table 8-6.

PARTICIPATION INDICATORS

Indicator 8: Participation in formal education

Participation in formal education is measured by the number of full-time equivalent (FTE) students enrolled in school per 100 persons aged 5 to 29 in the population. Participation is influenced not only by "demand" — the number of persons who can and wish to attend school — but also by "supply" — the number of places available. In terms of the latter, preprimary or post-compulsory education are more available in some states and countries than in others. A high participation ratio may reflect a corresponding high value placed on education by a society, or it may reflect an economy dependent on a highly trained workforce. In any event, national or state education strategies can produce a greater availability of educational opportunities.

- **The participation ratio for 5- to 29-year-olds in the United States in 1991 was 57.7, even with France's ratio, and just above Japan's (57.1). Among the G-7 countries, Italy, Germany, and the United Kingdom had lower ratios, whereas Canada had a participation ratio higher than that of the United States.**

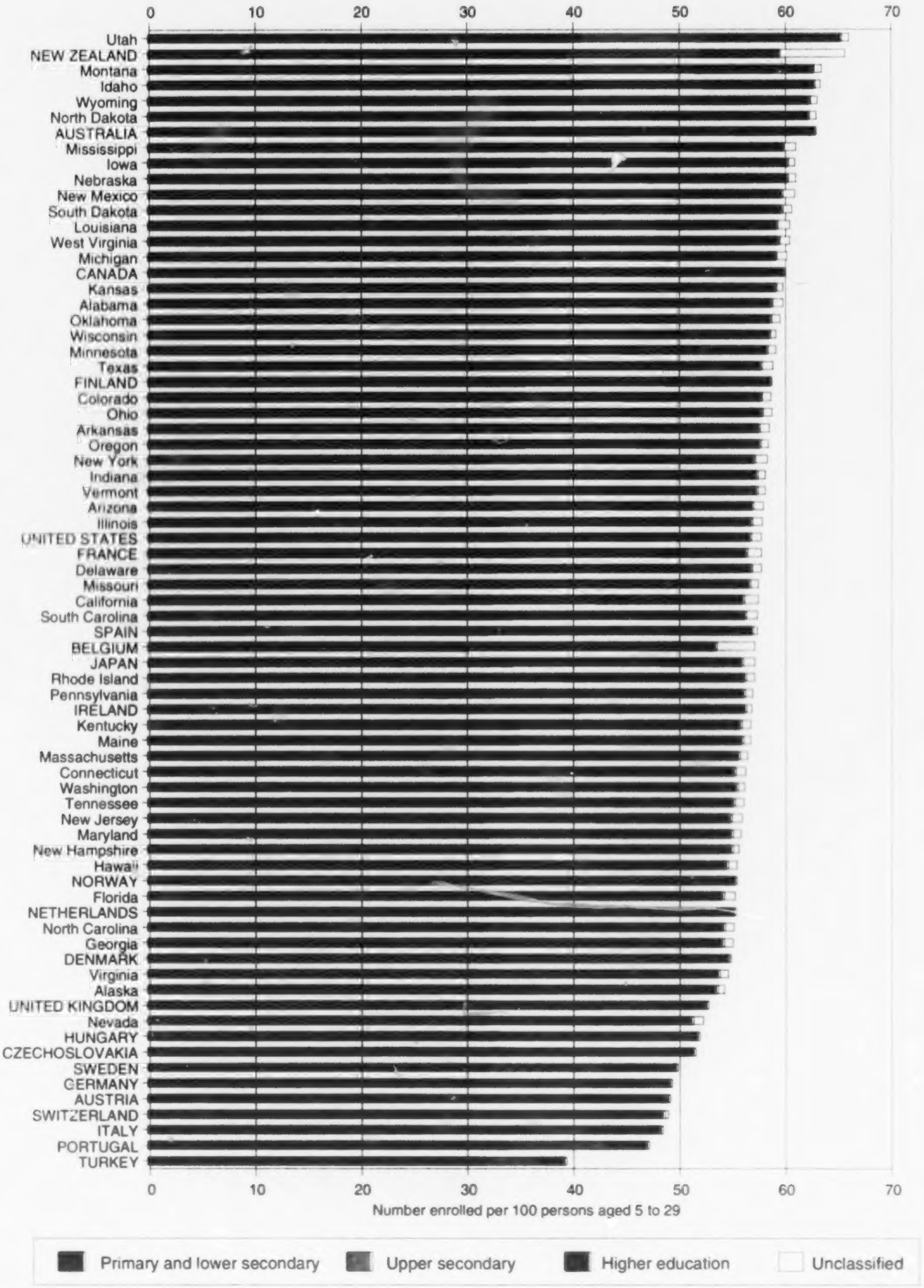
- **The United States and Canada had the highest ratios of persons participating in formal education at the higher education level, with ratios close to 13. Among the states, the ratio of 5- to 29-year-olds enrolled in higher education ranged from 7 in Alaska to 17 in Massachusetts and Rhode Island.**

- **The state with the smallest ratio of persons enrolled in formal education, Nevada (52) had a higher ratio than 9 of the 22 other countries for which data are available.**

Note on interpretation:

This enrollment ratio should *not* be interpreted as an enrollment *rate*. Enrollment ratios allow comparisons across states and nations by standardizing enrollment in a particular education level or, as with this indicator, across all education levels, to the size of the population of the age groups typical for enrollment at those levels. It is not, however, an estimate of the percentage of persons in those age groups who are enrolled in education. See supplemental note to Indicator 8 on pages 251-253 for a discussion of the calculation of this indicator.

Figure 8: Public and private enrollment per 100 persons in population aged 5 to 29, by level of education, country (1991), and state (1990)



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993, Table P11(A1). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

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Table 8a: Public and private enrollment per 100 persons in population aged 5 to 29, by level of education and country: 1991

Country	Primary and lower secondary	Upper secondary	Higher education	Unclassified	All levels[1]
Australia	45.6	9.7	7.6	0.0	62.8
Austria	25.8	14.6	8.7	0.0	49.1
Belgium	30.2	16.0	7.3	3.6	57.1
Canada	36.0	11.1	12.9	0.0	60.0
Czechoslovakia	33.8	14.8	2.9	0.0	51.5
Denmark	33.4	12.8	8.6	0.0	54.8
Finland	35.6	13.2	9.9	0.0	58.7
France	35.8	12.3	8.3	1.3	57.7
Germany	30.5	11.1	7.7	0.0	49.2
Hungary	33.0	16.4	2.5	0.0	51.9
Ireland	40.7	10.3	5.3	0.5	56.9
Italy	26.0	15.3	7.1	0.0	48.4
Japan	34.4	13.9	7.7	1.1	57.1
Netherlands	36.3	10.8	8.2	0.0	55.2
New Zealand	39.6	12.5	7.4	6.1	65.6
Norway	31.5	15.3	8.6	0.0	55.4
Portugal	34.0	9.1	4.0	0.0	47.0
Spain	32.0	17.0	8.0	0.3	57.3
Sweden	32.3	10.5	7.0	0.0	49.7
Switzerland	30.0	13.1	5.5	0.3	49.0
Turkey	31.8	4.9	2.6	0.0	39.3
United Kingdom	32.6	15.5	4.6	0.0	52.7
United States[2]	33.7	10.3	12.8	0.9	57.7

[1] Excludes the preprimary level.

[2] 1990 data.

NOTE: Because of rounding, details may not add to totals. "Unclassified" figures represent programs not assigned to a level of education. Such programs may be strictly ungraded, as many special education programs are, or they may span across the international standard boundaries that separate levels. See supplemental note to Indicator 8 on pp. 231–233 for a discussion of levels of education; on pp. 233–236 for a discussion of enrollment reference groups — typical starting ages and years of completion for upper secondary and higher education; on pp. 251–253 for details on data provided by West Germany, the Netherlands, Spain, and Switzerland; on the calculation of full time equivalent enrollments; and on comparing school enrollment in the Current Population Survey to the same in the 1990 Census.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table P11(A1). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population.

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Table 8b: Public and private enrollment per 100 persons in population aged 5 to 29, by level of education and state: 1990

State	Primary and lower secondary	Upper secondary	Higher education	Unclassified	All levels*
Alabama	35.3	11.0	12.5	1.0	59.6
Alaska	36.8	9.4	7.4	0.6	54.2
Arizona	34.2	9.7	13.1	0.9	57.9
Arkansas	36.2	11.2	10.2	0.9	58.5
California	32.4	9.9	13.8	1.3	57.4
Colorado	34.6	10.0	13.2	0.8	58.6
Connecticut	31.4	9.9	14.0	0.9	56.3
Delaware	33.0	9.4	14.5	0.8	57.7
District of Columbia	24.4	8.2	19.7	1.1	53.4
Florida	32.4	9.9	11.9	1.0	55.2
Georgia	33.6	10.0	10.6	0.8	55.0
Hawaii	33.1	9.5	12.0	0.8	55.4
Idaho	41.0	11.4	10.4	0.5	63.3
Illinois	33.4	10.4	13.1	0.9	57.9
Indiana	34.7	10.4	12.3	0.7	58.1
Iowa	36.1	10.5	13.7	0.6	60.9
Kansas	35.5	10.1	13.6	0.6	59.9
Kentucky	35.1	10.1	10.7	0.8	56.7
Louisiana	37.7	10.3	11.3	1.1	60.4
Maine	35.1	10.6	10.3	0.7	56.6
Maryland	32.2	9.5	13.3	0.8	55.8
Massachusetts	29.0	9.5	17.2	0.7	56.4
Michigan	34.4	11.0	13.8	0.9	60.1
Minnesota	34.5	10.2	13.7	0.7	59.1
Mississippi	37.7	10.8	11.4	1.1	61.0
Missouri	34.4	10.1	12.2	0.7	57.4
Montana	39.9	11.6	11.2	0.7	63.4
Nebraska	35.8	10.9	13.6	0.7	60.9
Nevada	32.2	9.9	9.2	0.9	52.2
New Hampshire	33.2	9.5	12.3	0.6	55.5
New Jersey	31.6	10.6	12.7	1.0	56.0
New Mexico	38.4	10.6	10.8	1.1	60.9
New York	31.7	10.4	15.1	1.1	58.3
North Carolina	31.6	10.2	12.5	0.8	55.1
North Dakota	36.6	10.9	14.8	0.6	63.0
Ohio	34.7	10.9	12.3	0.8	58.6
Oklahoma	36.1	10.7	11.9	0.8	59.5
Oregon	35.5	10.5	11.7	0.7	58.3
Pennsylvania	32.6	10.5	13.1	0.7	56.9
Rhode Island	29.9	9.2	17.2	0.8	57.1
South Carolina	34.3	10.6	11.4	1.0	57.3
South Dakota	38.1	10.5	11.2	0.8	60.6
Tennessee	33.6	10.5	11.1	0.8	56.0
Texas	35.9	10.3	11.6	1.0	58.8
Utah	40.8	10.9	13.6	0.7	66.1
Vermont	32.6	10.4	14.4	0.7	58.1
Virginia	31.3	9.7	12.8	0.8	54.5
Washington	34.3	9.9	11.3	0.6	56.2
West Virginia	36.5	11.9	11.1	0.9	60.4
Wisconsin	35.1	10.5	13.0	0.5	59.2
Wyoming	39.9	11.4	11.1	0.6	63.0

*Excludes the preprimary level.

NOTE: Because of rounding, details may not add to totals. "Unclassified" figures represent persons who are attending school, who have completed the 12th grade, but who have not yet obtained a diploma. Those persons could be completing graduation requirements or attending a higher education institution with open enrollment.

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Indicator 9: Enrollment in preprimary education

This indicator measures the percentage of 3- to 6-year-olds enrolled full-time in public and private preprimary education by single year of age. This percentage reflects the importance placed on student participation in preprimary education and the availability of low-cost or public education. Variations in the percentage of children enrolled in preprimary education at different ages are affected by differences in the timing of entry and transition between preprimary and primary education. This indicator can be affected by inconsistencies in the definition of preprimary education among countries, however.

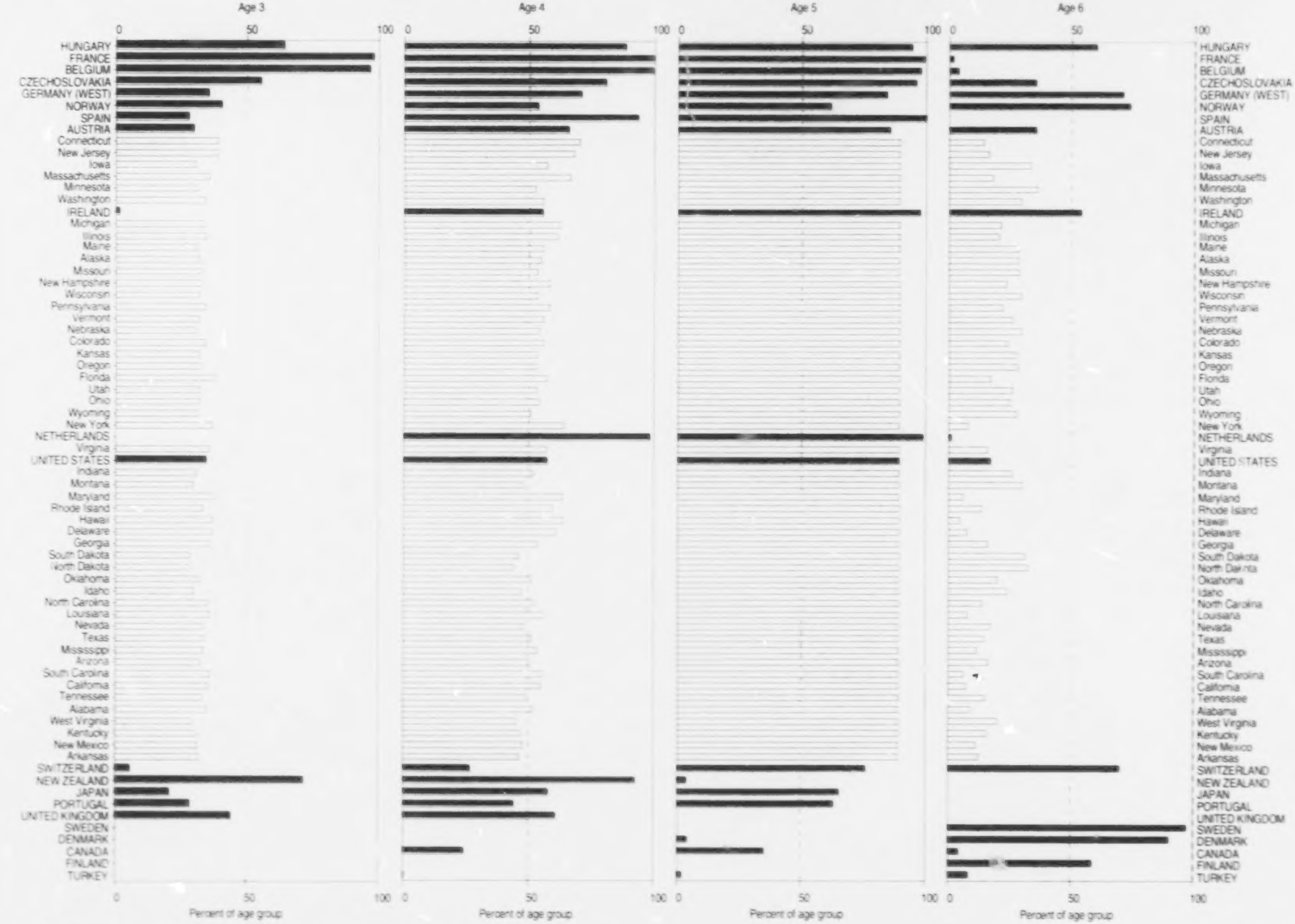
- **In the G-7 countries for which data were available, 1991 preprimary education enrollment for 3-year-olds ranged from 21 percent in Japan to 98 percent in France. In the United States, about one third of 3-year-olds were enrolled.**

- **By age 4, over half of the children in the United States were enrolled (57 percent). In five countries — France, Belgium, the Netherlands, New Zealand, and Spain — enrollment among 4-year-olds exceeded 90 percent.**

- **Enrollment rates in preprimary education among children at the younger and older extremes of the 3- to 6-year-old population differed significantly between states and nations. Five of the 15 countries for which data were available reported that more than half of all 3-year-olds were enrolled in preprimary education programs. However, none of the U.S. states showed an enrollment rate that approached 50 percent among 3-year-olds. Less than one-fifth of the 6-year-olds in the U.S. were enrolled in preprimary education programs, while 10 of the 16 nations for which data were available reported enrollment rates above 35 percent for 6-year-olds.**

- **In most of the nations and states included — with the exception of Belgium, Denmark, France, New Zealand, Norway, and Turkey — the highest enrollment rates were among 5-year-olds. (Enrollment rates were not available for 5-year-olds in Finland, Sweden, and the United Kingdom.)**

Figure 9: Enrollment in public and private preprimary education, by age, country (1991), and state (1990)



NOTE: States and nations are sorted from high to low according to the sum of the four ages' enrollment rates.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993, Table P12. U.S. Department of Commerce, Bureau of

Table 9a: Enrollment in public and private preprimary education, by age and country: 1991

	Age			
Country	3	4	5	6
Austria	29.5	65.7	85.4	35.4
Belgium	96.5	99.4	97.7	3.5
Canada	—	24.1	35.1	4.1
Czechoslovakia	55.0	80.5	95.9	35.2
Denmark	—	—	4.0	89.8
Finland	—	—	—	58.4
France	98.0	100.0	99.2	1.4
Germany (West)	35.1	70.6	84.1	70.8
Hungary	63.8	88.4	94.2	59.9
Ireland	1.3	55.3	97.6	53.7
Japan	20.5	57.8	65.1	—
Netherlands	—	98.3	98.9	0.8
New Zealand	71.6	92.6	3.7	—
Norway	40.0	53.5	61.4	73.6
Portugal	28.2	44.0	63.0	—
Spain	27.6	93.5	100.0	—
Sweden	—	—	—	97.1
Switzerland	5.5	26.4	75.8	69.8
Turkey	—	0.3	1.7	8.0
United Kingdom	44.0	60.7	—	—
United States[*]	34.4	57.1	89.3	17.0

— Problems of definition render the calculation of participation rates infeasible.

[*] 1990 data.

NOTE: See supplemental note to Indicator 9 on pp. 253-257 for details on data provided by Canada, Czechoslovakia, Finland, France, Ireland, the Netherlands, Spain, Sweden, Switzerland, and the United Kingdom, and on the calculation of full-time equivalent enrollments. United States figures are estimated by using the April, 1990 U.S. Census totals for preprimary enrollment and allocating them to age levels according to the pattern found in the October, 1990 Current Population Survey. See technical note on pp. 254-257 for a more detailed explanation.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table P12. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population; Current Population Survey, October, 1990.

Table 9b: Enrollment in public and private preprimary education, by age and state: 1990

State	Age 3	4	5	6
Alabama	35.0	51.7	89.1	9.2
Alaska	32.2	54.7	89.4	28.3
Arizona	32.0	50.1	89.2	16.1
Arkansas	31.6	46.1	89.1	12.2
California	35.3	54.8	89.2	7.0
Colorado	33.9	55.9	89.5	23.7
Connecticut	39.0	70.2	89.6	14.0
Delaware	37.0	60.9	89.3	7.5
District of Columbia	41.8	65.9	89.1	0.2
Florida	37.8	57.2	89.3	16.9
Georgia	36.1	53.7	89.2	15.7
Hawaii	37.1	63.9	89.4	4.5
Idaho	29.8	46.8	89.4	23.9
Illinois	34.6	61.3	89.5	20.2
Indiana	30.8	51.5	89.4	25.7
Iowa	30.6	57.2	89.6	33.1
Kansas	31.8	53.3	89.5	27.8
Kentucky	30.7	47.0	89.1	15.2
Louisiana	35.9	56.4	89.2	7.6
Maine	31.3	55.9	89.5	28.3
Maryland	37.7	63.5	89.4	6.0
Massachusetts	35.8	66.5	89.6	17.7
Michigan	33.5	62.4	89.6	21.1
Minnesota	31.4	52.6	89.5	36.0
Mississippi	33.6	53.3	89.1	11.5
Missouri	32.4	53.5	89.4	28.6
Montana	29.4	47.8	89.4	30.1
Nebraska	30.4	53.8	89.5	29.4
Nevada	33.6	48.1	89.1	16.9
New Hampshire	32.6	58.3	89.5	23.6
New Jersey	38.9	68.0	89.5	16.1
New Mexico	31.3	47.8	89.1	11.1
New York	36.8	64.1	89.4	7.8
North Carolina	35.2	51.8	89.2	13.5
North Dakota	28.1	44.1	89.3	32.3
Ohio	31.8	54.0	89.4	25.1
Oklahoma	32.3	50.7	89.3	20.0
Oregon	32.2	52.6	89.4	28.0
Pennsylvania	34.1	58.3	89.5	21.7
Rhode Island	33.3	59.5	89.5	13.6
South Carolina	36.1	55.5	89.1	6.0
South Dakota	28.3	45.8	89.3	31.1
Tennessee	33.2	49.1	89.2	14.6
Texas	33.5	50.8	89.2	14.2
Utah	32.0	53.0	89.4	26.0
Vermont	31.9	55.8	89.5	26.1
Virginia	35.7	57.2	89.4	15.6
Washington	34.2	55.8	89.5	29.4
West Virginia	29.4	45.1	89.1	19.6
Wisconsin	31.3	53.4	89.5	29.3
Wyoming	31.2	50.4	89.3	27.8

NOTE: See supplemental note to Indicator 9 on pp. 253-257 for a detailed explanation of the adjustment of preprimary education enrollment rates for U.S. states. Figures are estimated by using the April, 1990 U.S. Census totals for preprimary enrollment and allocating them to age levels according to the pattern found in the October, 1990 Current Population Survey. See technical note on pp. 254-257 for a more detailed explanation.

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing; Current Population Survey, October, 1990.

Indicator 10: Secondary education enrollment

The secondary education enrollment rate measures the percentage of persons in a country or state of a certain age who are enrolled in school programs classified as secondary. Secondary education encompasses the end stage of compulsory education in most countries. Because the end year of the compulsory age range typically arrives for most teens before their secondary education is complete, persistence in school past the end year reflects the desirability and importance of secondary-level credentials. Countries and states with high secondary education enrollment rates may have economies that require highly skilled labor forces and depend on the education system to provide necessary training. Countries and states with relatively high rates also may have a large number of students receiving more than one secondary education credential. For example, in Germany, many skilled workers graduate from secondary school with a vocational credential, then return to school later for a higher or different credential.

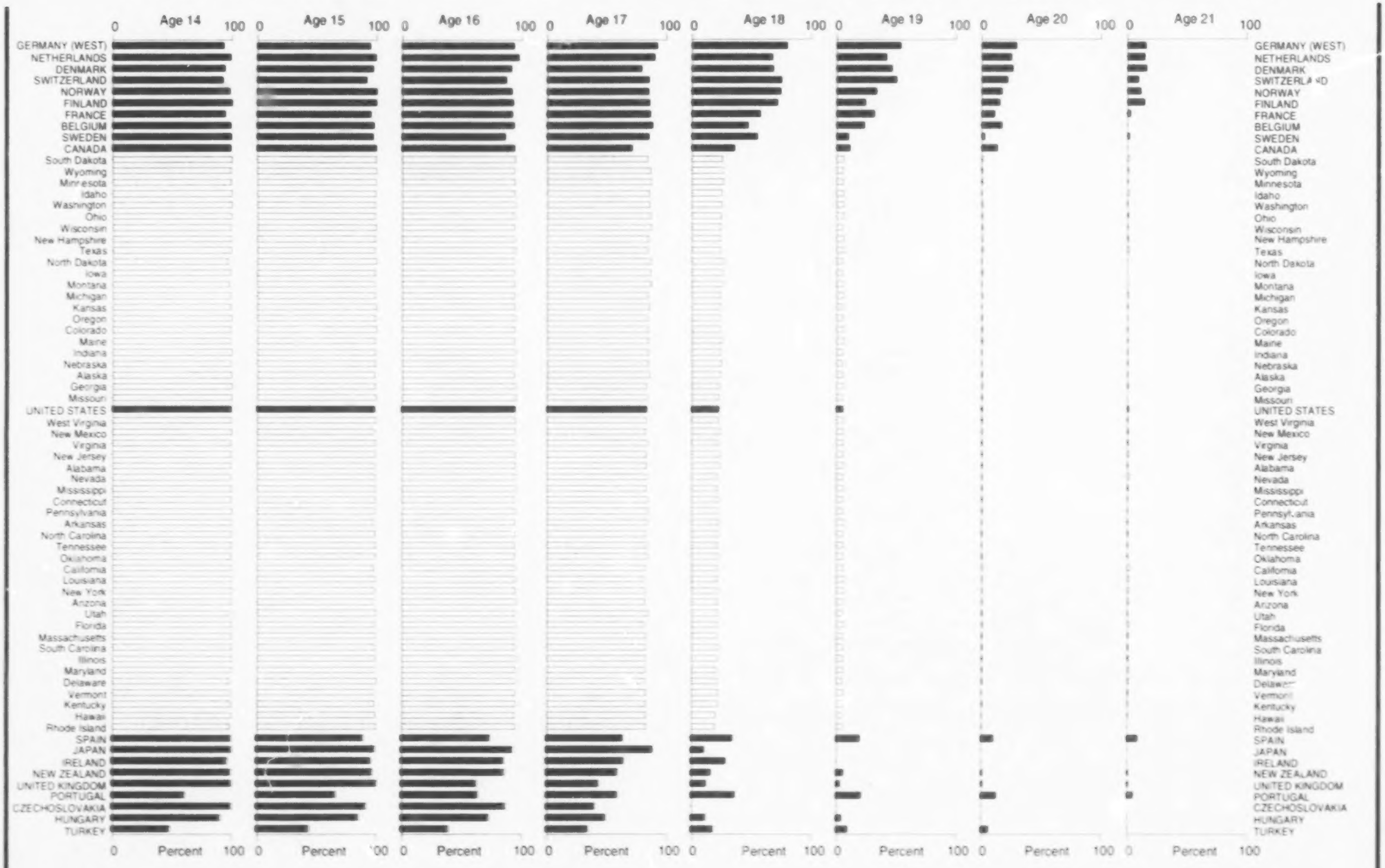
- **Enrollment in secondary education was above 90 percent at ages 14 and 15 in all states in 1990 and all countries in 1991, except for Hungary (age 15), Portugal, Spain (age 15), and Turkey. Enrollment at age 16 dropped below 90 percent also in Czechoslovakia, Ireland, New Zealand, Sweden, Switzerland, and the United Kingdom. At age 17, enrollment dropped below 90 percent in all states and countries except West Germany and the Netherlands. Enrollments in West Germany and the Netherlands dropped below 90 percent at age 18.**

- **In 9 of the 19 other countries, over 20 percent of 19-year-olds attended secondary school; however, of the U.S. states had enrollment rates above 7 percent among 19-year-olds. Likewise among 21-year-olds, 5 of the 19 other countries recorded rates above 10 percent, while none of the U.S. states showed rates even above 3 percent at that age.**

Note on interpretation:

Countries differ greatly in how they classify certain programs as either higher education or upper secondary programs. For example, some programs that are begun subsequent to the completion of general secondary education are classified as non-university higher education in the United States and in parts of Canada, whereas they are defined as upper secondary education in most other countries. (See the supplemental note on levels of education on pages 231-233.)

Figure 10: Enrollment in public and private secondary education, by age, country (1991), and state (1990)



NOTE: States and nations are sorted from high to low according to the sum of the eight ages' enrollment rates.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993, Table P13(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing; Current Population Survey, October, 1990.

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Table 10a: Enrollment in public and private secondary education, by age and country: 1991

Country	Age							
	14	15	16	17	18	19	20	21
Belgium	98.7	97.3	93.5	88.3	47.0	23.1	16.9	0.0
Canada	98.7	99.3	93.9	71.1	35.5	11.1	13.0	0.0
Czechoslovakia	99.9	91.4	86.9	39.8	0.0	0.0	0.0	0.0
Denmark	93.5	96.7	91.1	78.8	67.9	46.2	25.7	15.7
Finland	99.8	99.6	92.9	85.7	71.6	24.1	14.9	14.0
France	93.9	94.7	92.0	86.4	57.2	31.6	10.6	2.6
Germany (West)	92.9	94.5	93.6	92.4	79.6	53.5	29.0	15.4
Hungary	90.6	85.0	73.0	49.3	11.9	4.6	0.0	0.0
Ireland	95.9	95.1	85.1	64.7	28.8	0.0	0.0	0.0
Japan	100.0	98.4	92.8	88.8	1.8	—	—	—
Netherlands	98.9	99.2	97.2	90.0	67.4	41.5	24.5	14.1
New Zealand	99.1	96.4	85.7	58.9	16.1	6.0	1.4	0.9
Norway	97.9	100.0	91.7	84.7	74.2	33.5	16.9	11.1
Portugal	60.3	65.3	63.4	58.9	36.5	20.7	12.6	4.9
Spain	99.5	89.0	73.5	63.9	34.6	19.6	10.2	8.5
Sweden	99.2	96.9	86.0	85.3	54.7	10.0	2.5	1.7
Switzerland	92.2	91.4	86.9	85.1	75.2	50.2	21.5	8.9
Turkey	47.9	43.3	38.7	34.4	18.3	9.5	6.0	0.0
United Kingdom	100.0	100.0	62.4	43.1	12.3	13.4	1.4	0.9
United States*	99.6	98.4	94.6	83.7	22.8	5.7	1.0	1.1

— Not available.

*1990 data.

NOTE: See supplemental note to Indicator 10 on pp. 258-261 for details on data provided by Canada, Czechoslovakia, Finland, France, Ireland, the Netherlands, Spain, Sweden, Switzerland, and the United Kingdom, and on the calculation of full-time equivalent enrollments. United States figures are estimated by using the April, 1990 U.S. Census totals for secondary enrollment and allocating them to age levels according to the pattern found in the October, 1990 Current Population Survey. See technical note on pp. 259-261 for a more detailed explanation. See supplemental note on pp. 231-233 for a discussion of levels of education.

SOURCE: Organization for Economic Co-operation and Development, Center for Education Research and Innovation, *Education at a Glance, 1993,* Table P13(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing; Current Population Survey, October, 1990.

Table 10b: Enrollment in public and private secondary education, by age and state: 1990

State	Age 14	15	16	17	18	19	20	21
Alabama	98.8	97.9	94.7	83.4	23.6	6.3	0.8	0.6
Alaska	99.5	97.7	93.8	86.2	24.3	5.1	0.7	0.4
Arizona	99.9	97.9	95.3	82.1	21.4	5.7	1.2	1.3
Arkansas	99.7	97.5	94.4	83.8	23.0	6.3	0.6	0.5
California	99.9	97.6	94.8	82.1	21.3	5.6	1.5	2.4
Colorado	98.7	99.8	94.3	84.8	23.9	5.8	0.8	0.5
Connecticut	99.1	98.5	94.3	84.2	23.0	5.3	0.8	0.6
Delaware	97.8	99.9	94.7	82.2	21.7	5.0	1.0	1.3
District of Columbia	100.0	98.5	95.4	79.9	20.1	6.6	0.8	3.0
Florida	99.5	97.9	95.0	81.5	21.9	6.2	1.1	1.5
Georgia	100.0	98.2	94.8	83.3	22.8	6.1	1.1	0.9
Hawaii	99.1	98.8	94.2	82.9	19.9	4.3	0.3	0.5
Idaho	100.0	99.2	94.3	85.8	25.2	5.9	0.4	1.5
Illinois	99.7	98.5	94.6	82.7	21.5	5.2	1.0	0.9
Indiana	100.0	98.5	94.7	84.9	24.0	5.1	0.6	0.5
Iowa	99.1	98.7	94.1	86.8	25.6	4.9	0.7	0.0
Kansas	98.7	99.9	94.3	85.6	24.5	5.3	0.5	0.3
Kentucky	98.7	98.0	94.7	82.6	21.7	5.4	0.7	0.4
Louisiana	100.0	98.4	94.7	81.1	21.6	6.2	1.3	1.7
Maine	98.2	98.5	94.2	85.1	25.2	5.9	0.8	0.5
Maryland	100.0	97.9	94.6	82.5	21.0	5.4	0.9	1.3
Massachusetts	99.8	98.8	94.5	83.4	20.8	5.3	0.9	1.0
Michigan	99.6	98.5	94.4	84.9	23.5	5.8	1.1	1.3
Minnesota	99.1	99.5	94.1	87.2	26.6	5.6	0.8	0.4
Mississippi	100.0	98.6	94.5	83.4	21.6	5.9	1.0	0.9
Missouri	100.0	99.5	94.9	83.8	22.9	5.0	0.8	0.0
Montana	97.7	97.7	94.4	87.1	25.5	6.8	0.4	0.1
Nebraska	98.8	98.7	94.3	84.9	25.3	5.0	0.6	0.3
Nevada	98.5	98.7	94.7	84.0	21.8	5.4	1.1	1.9
New Hampshire	99.3	99.2	94.3	85.3	23.9	6.3	1.2	1.0
New Jersey	99.6	98.1	94.5	83.3	23.3	5.4	1.0	1.2
New Mexico	100.0	97.7	94.5	82.8	23.7	5.8	1.2	0.7
New York	99.8	97.8	94.8	82.2	21.5	6.1	1.2	1.5
North Carolina	99.8	98.2	94.7	83.2	22.8	5.3	0.7	1.0
North Dakota	96.9	100.0	93.9	87.0	27.3	4.8	0.3	0.0
Ohio	99.3	98.8	94.1	86.3	24.7	6.2	0.7	0.7
Oklahoma	99.2	98.5	94.2	83.9	22.9	5.1	0.8	0.5
Oregon	100.0	98.9	94.7	84.0	23.8	5.4	0.7	0.6
Pennsylvania	99.7	98.3	94.6	84.5	22.6	5.2	0.7	0.5
Rhode Island	98.1	99.2	94.8	83.3	19.4	4.7	0.5	0.0
South Carolina	99.2	97.7	94.6	82.9	22.3	5.5	1.0	0.9
South Dakota	100.0	99.4	94.6	84.6	25.5	5.9	1.1	1.5
Tennessee	99.6	98.9	94.4	84.0	22.1	5.6	0.6	0.4
Texas	99.5	98.4	94.6	84.1	24.1	6.8	1.4	1.6
Utah	98.0	99.5	94.1	84.5	22.2	4.7	1.0	0.6
Vermont	98.3	97.9	94.6	83.4	22.1	5.7	0.4	0.9
Virginia	99.2	99.0	94.3	84.1	22.6	5.6	0.8	0.7
Washington	99.9	98.5	94.6	86.2	25.1	6.0	1.1	0.5
West Virginia	99.6	100.0	94.6	83.4	22.4	5.5	0.9	0.3
Wisconsin	99.2	99.3	94.0	87.6	24.5	5.0	0.8	0.4
Wyoming	99.1	100.0	94.0	86.9	25.9	5.8	0.8	1.1

NOTE: See supplemental note to Indicator 10 on pp. 258-261 for a detailed explanation of the contrast between Census- and Current Population Survey-derived estimates of secondary education enrollment rates and a note on the calculation of full-time equivalent enrollments. Figures are estimated by using the April, 1990 U.S. Census totals for secondary enrollment and allocating them to age levels according to the pattern found in the October, 1990 *Current Population Survey*. See technical note on pp. 259-261 for a more detailed explanation.

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing; Current Population Survey, October, 1990.

Indicator 11: Entry ratio to higher education

This indicator measures the number of new full-time entrants into institutions of higher education per 100 persons at the entry reference age within a state or nation. The entry reference age is generally one year older than the graduation reference age for secondary education. This ratio represents the proportion of a country or state's population that attempts coursework in higher education. Included in this indicator are data for U.S. states for first-time entrants by location of school and by location of students' original state of residence.

- **In 1991, the United States had 45.8 first-time entrants into full-time public and private higher education per 100 persons at the entry reference age (18 years of age in the United States). Japan was the G-7 country with the highest ratio (53.1). The other G-7 countries included here — Germany, France, and the United Kingdom — had ratios below that of the United States.**

- **For the most part, the U.S. states in 1990 had higher ratios of first-time entrants into full-time public and private higher education than the nations for which data were available. Counting first-time entrants by location of school, 21 states, but only 3 countries, had ratios of 50 or greater. Likewise, more than half of the 19 countries included had ratios below 40, whereas only 10 states did.**

- **In 12 of 19 countries for which data were available and in 45 of 50 U.S. states the female first-time entry ratio exceeded the male ratio.**

- **The U.S. states recording first-time entry ratios above 50 varied, depending on where migrating new entrants were counted — at their original state of residence or at the location of their school. Six states — Wyoming, North Dakota, Iowa, New York, Washington, and Nebraska — had ratios above 55 on both measures. *Sending* states with ratios above 55 included Georgia and New Jersey. *Receiving* states with ratios above 55 included Rhode Island, Vermont, New Hampshire, Utah, Massachusetts, Idaho, and Delaware.**

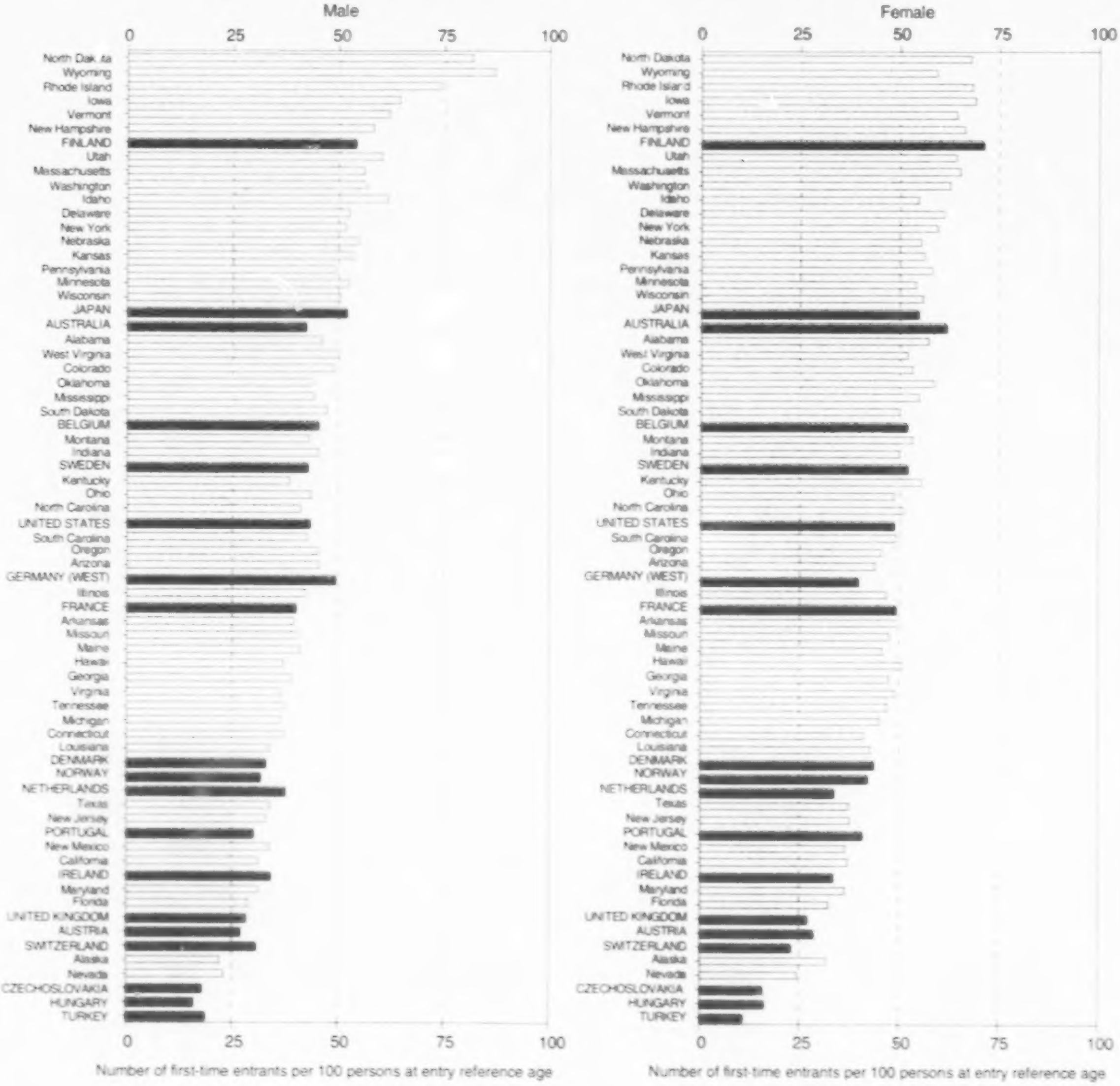
Notes on interpretation:

Enrollment ratios should *not* be interpreted as enrollment *rates*. Enrollment ratios allow comparisons across states and nations by standardizing enrollment in a particular education level to the size of the population in an age group typical for enrollment in that level. It is not, however, an estimate of the percentage of that age group who are enrolled in education at that level.

In the United States, students often enroll in a school located in a state other than the one in which they reside. Evaluating two sets of figures based on location of school or location of students' original state of residence illustrates patterns of student migration across states. If many students migrate into a state for schooling and few migrate out of it, that state's first-time entry ratio will be higher when counted at location of school than at students' original state of residence. This is because the denominator for both ratios (reference-age population of the state) stays the same, but the numerator increases when the net migration of students to the state is positive.

Only students attending higher education institutions in their home country are counted as new entrants. Thus, there is no distinction at the country-level between counting a new entrant at the location of the institution or the student's home. Both locations lie in the same country.

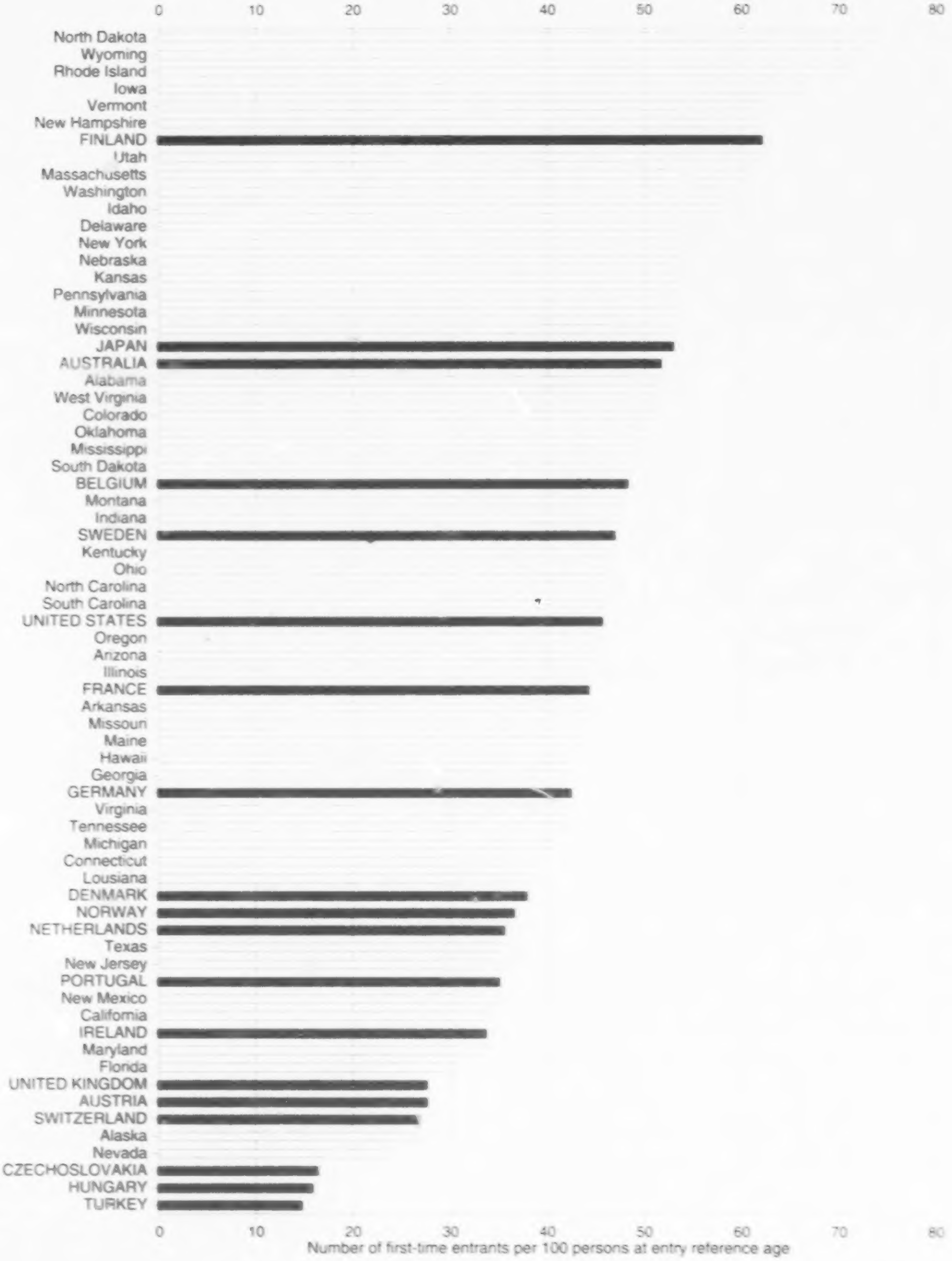
Figure 11a: **Number of first-time entrants into full-time public and private higher education per 100 persons at entry reference age, counted at location of institution, by sex, country (1991), and state (1990)**



NOTE: States and nations are sorted from high to low based on the sum of the numbers from the two figures.

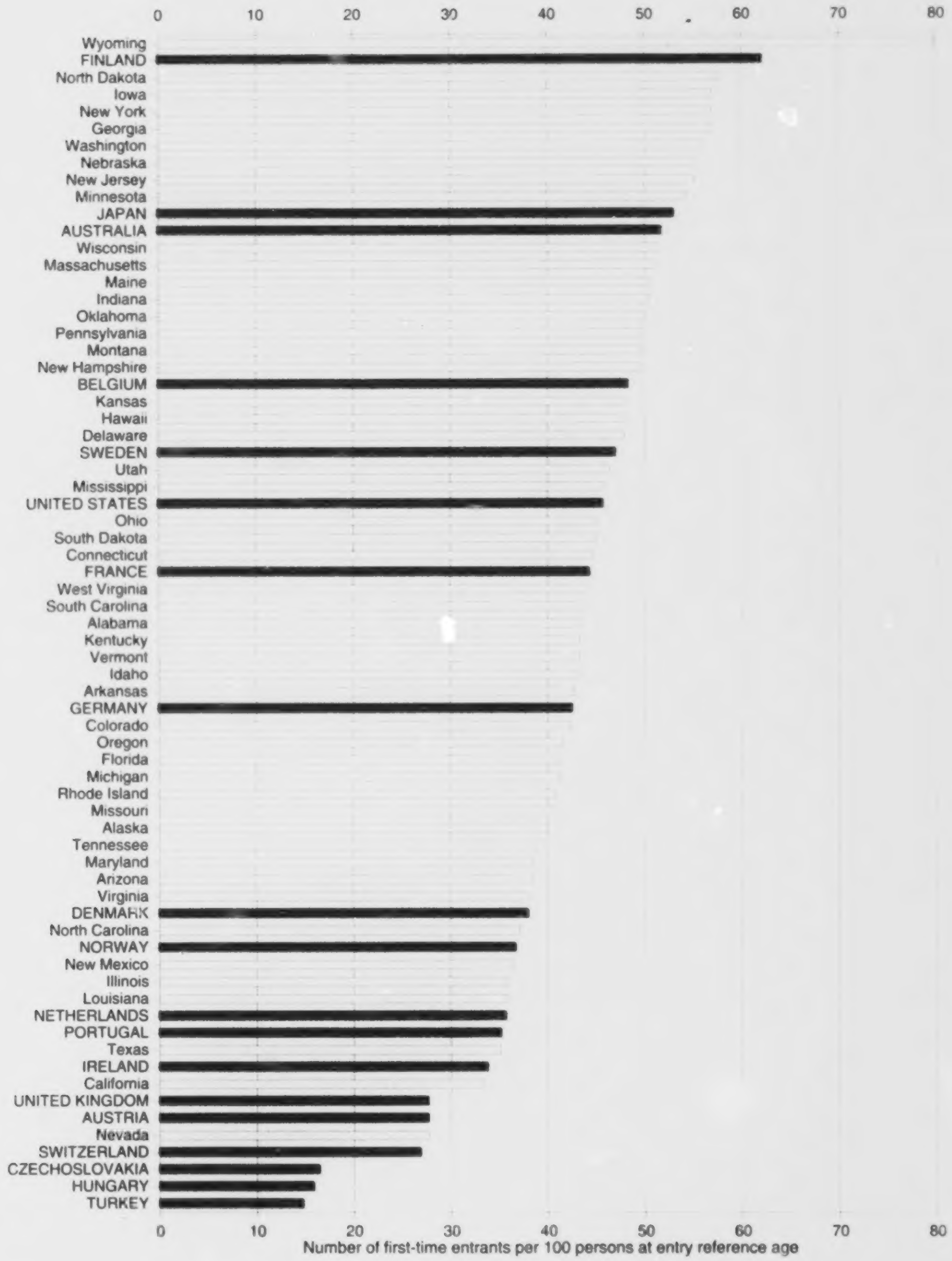
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993, Table P15. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. U.S. Department of Education, National Center for Education Statistics, Digest of Education Statistics, 1993, Table 177; Digest of Education Statistics, 1994, Table 199.

Figure 11b: Number of first-time entrants into full-time public and private higher education per 100 persons at entry reference age, counted at location of institution, by country (1991) and state (1990)



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table P15. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, Table 177; *Digest of Education Statistics, 1994*, Table 199.

Figure 11c: **Number of first-time entrants into full-time public and private higher education per 100 persons at entry reference age, counted at location of student's original state of residence, by country (1991) and state (1990)**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table P15. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Table 177; *Digest of Education Statistics, 1994,* Table 199.

Table 11a: Number of first-time entrants into full-time public and private higher education per 100 persons at the entry reference age, by sex and country: 1991

Country	Entry reference age	All students	Sex	
			Male	Female
Australia	18	51.8	42.2	61.6
Austria	19	27.7	27.0	28.5
Belgium	18	48.4	45.2	51.7
Czechoslovakia	18	16.5	17.8	15.7
Denmark	19	38.0	32.9	43.5
Finland	19	62.2	53.8	70.8
France	18	44.4	39.9	49.0
Germany[1]	18/19	42.6	49.3	39.4
Hungary	19	15.9	15.8	16.1
Ireland	18	33.8	34.2	33.4
Japan	18	53.1	51.8	54.5
Italy	19	—	—	—
Netherlands	19	35.7	37.6	33.6
New Zealand	18	—	—	—
Norway	19	36.7	31.7	42.0
Portugal	18	35.2	30.0	40.8
Spain	18	—	—	—
Sweden	19	47.1	42.7	51.9
Switzerland	20	26.9	30.7	22.9
Turkey	18	14.8	18.6	10.7
United Kingdom	18	27.7	28.3	27.0
United States[2]	18	45.8	43.2	48.5

— Not available.

[1] Male and female figures apply to the West Germany only. The "all students" figure applies to Germany as a whole.

[2] 1990 data.

NOTE: Only students attending higher education institutions in their home country are counted among the new entrants. Thus, there is no distinction in the country-level data (as there is in the state-level data) between counting a new entrant at the location of the institution or the student's home. Both locations lie in the same country. See supplemental note to Indicator 11 on pp. 262–264 for details on data provided by Denmark, Finland, France, Hungary, Ireland, the Netherlands, Spain, the United Kingdom, and the United States, for a discussion of the non-inclusion of proprietary schools, for a discussion of the calculation of full-time equivalent enrollments, and for a discussion comparing U.S. entry-ratio data from the Integrated Postsecondary Education Data System (IPEDS) and the OECD's INES Project; on pp. 231–233 for a discussion of levels of education and on pp. 233–236 for a discussion of enrollment reference groups and entry reference ages.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table P15. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Table 177. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table 11b: Number of first-time entrants into full-time public and private higher education per 100 persons age 18, by location, sex, and state: 1990

State	Counted at location of student's higher education institution			Counted at location of student's original state of residence
	All students	Male	Female	
Alabama	51.5	46.0	57.2	43.4
Alaska	26.4	22.1	31.6	40.0
Arizona	44.7	45.5	43.8	38.4
Arkansas	44.4	39.6	49.2	42.7
California	33.9	31.1	37.2	33.4
Colorado	51.0	48.9	53.3	42.3
Connecticut	39.0	37.1	40.9	44.7
Delaware	57.1	52.5	61.2	47.9
District of Columbia	65.2	57.3	72.7	49.4
Florida	30.5	28.8	32.3	41.3
Georgia	43.1	39.0	47.3	56.9
Hawaii	43.3	37.0	50.8	48.0
Idaho	57.9	61.7	54.7	43.3
Illinois	44.5	42.4	46.7	35.8
Indiana	47.6	45.2	50.0	50.4
Iowa	66.7	64.5	68.9	56.9
Kansas	54.8	53.7	56.2	48.0
Kentucky	46.5	38.5	55.6	43.3
Louisiana	38.3	33.8	42.7	35.8
Maine	43.4	41.2	45.7	50.4
Maryland	33.8	31.2	36.4	38.5
Massachusetts	60.7	56.1	65.1	51.1
Michigan	40.6	36.4	45.1	41.3
Minnesota	53.2	52.4	54.0	54.3
Mississippi	49.4	44.1	54.8	45.9
Missouri	43.9	40.6	47.3	40.6
Montana	47.8	43.0	53.2	49.7
Nebraska	55.1	54.7	55.4	55.2
Nevada	23.7	23.0	24.5	27.7
New Hampshire	62.4	58.2	66.3	49.7
New Jersey	35.3	33.1	37.7	55.1
New Mexico	35.1	33.8	36.5	36.5
New York	55.6	51.7	59.5	56.9
North Carolina	46.0	41.2	50.9	37.1
North Dakota	74.3	81.6	67.8	57.6
Ohio	46.2	43.7	48.6	45.1
Oklahoma	50.8	43.9	58.5	50.0
Oregon	45.3	45.2	45.4	41.6
Pennsylvania	53.5	49.2	58.2	49.7
Rhode Island	71.1	74.2	68.2	40.9
South Carolina	45.9	42.6	49.1	43.9
South Dakota	48.8	47.3	50.1	45.0
Tennessee	41.9	37.2	47.1	39.7
Texas	35.5	33.8	37.3	35.1
Utah	62.2	60.2	64.1	46.4
Vermont	63.0	61.9	64.2	43.3
Virginia	42.4	36.5	49.0	38.2
Washington	59.7	56.9	62.5	56.1
West Virginia	51.0	50.1	52.0	44.3
Wisconsin	53.1	50.4	55.8	51.5
Wyoming	72.7	87.0	59.2	79.8

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Table 177; *Digest of Education Statistics, 1994,* Table 199.

Indicator 12: Non-university higher education enrollment

Non-university higher education institutions typically provide occupationally-oriented programs that may or may not prepare students to proceed to university degree programs. The percentage of individuals in different age groups who are enrolled in non-university higher education reflects (1) the role of non-university higher education in the training process, (2) the duration of non-university higher education programs, and (3) the classification of programs as upper secondary, non-university, or university higher education. In countries with high non-university higher education enrollment rates, non-university higher education may serve as the place to receive training and certification for a large number of occupations, whereas in countries with low rates, similar training may occur at other levels in the system. This indicator displays the percentage of persons from certain age groups who are enrolled in public and private non-university higher education (defined as community or junior colleges in the United States). Rates are provided for three age groups (18–21 years, 22–29 years, and 18–29 years) and are broken down by enrollment status (full-time and part-time).

- **Full-time non-university higher education enrollment rates for 18- to 21-year-olds in the G–7 countries fell into two groups in 1991: those with relatively high enrollment rates and those with relatively low enrollment rates. The United States recorded a relatively high enrollment rate (7.5 percent), as did Canada and France, both with 8.1 percent. West Germany and the United Kingdom both reported a comparatively low enrollment rate of 1.9 percent. In Belgium and the Netherlands, non-university full-time enrollment among 18- to 21-year-olds exceeded 10 percent.**

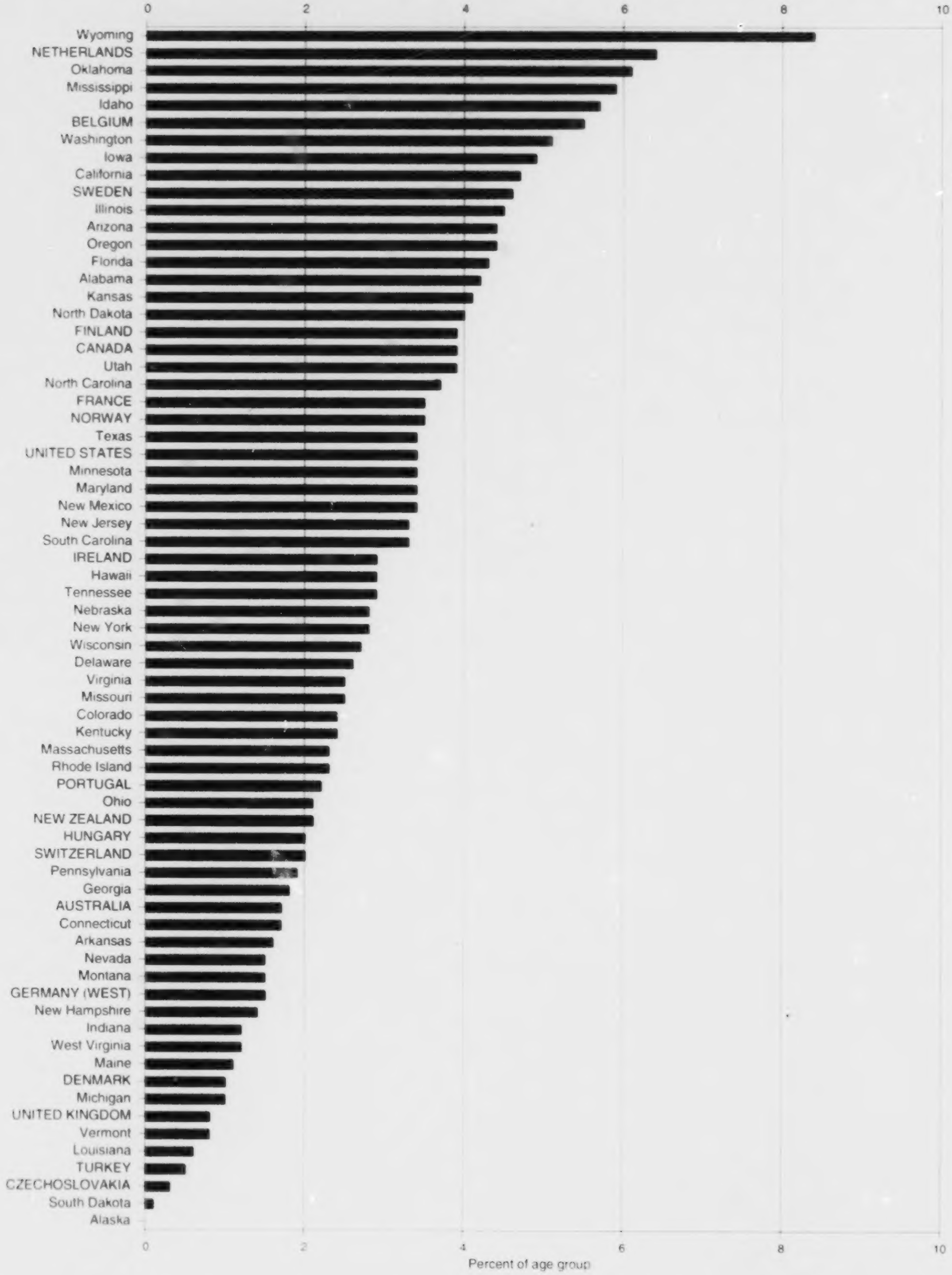
- **Part-time non-university education for 18- to 21-year-olds was rare in most countries. Exceptions to this pattern were the United States, the United Kingdom, and Australia. Indeed, in the United Kingdom and Australia, more part-time than full-time students attended non-university programs.**

- **Full-time enrollment in non-university higher education declined, sometimes dramatically, as students progressed into their twenties in every country reporting data except Denmark and Switzerland. However, part-time enrollment rates, among countries where part-time enrollments were counted, decreased in as many countries as they increased, as students moved into the older age cohort.**

Note on interpretation:

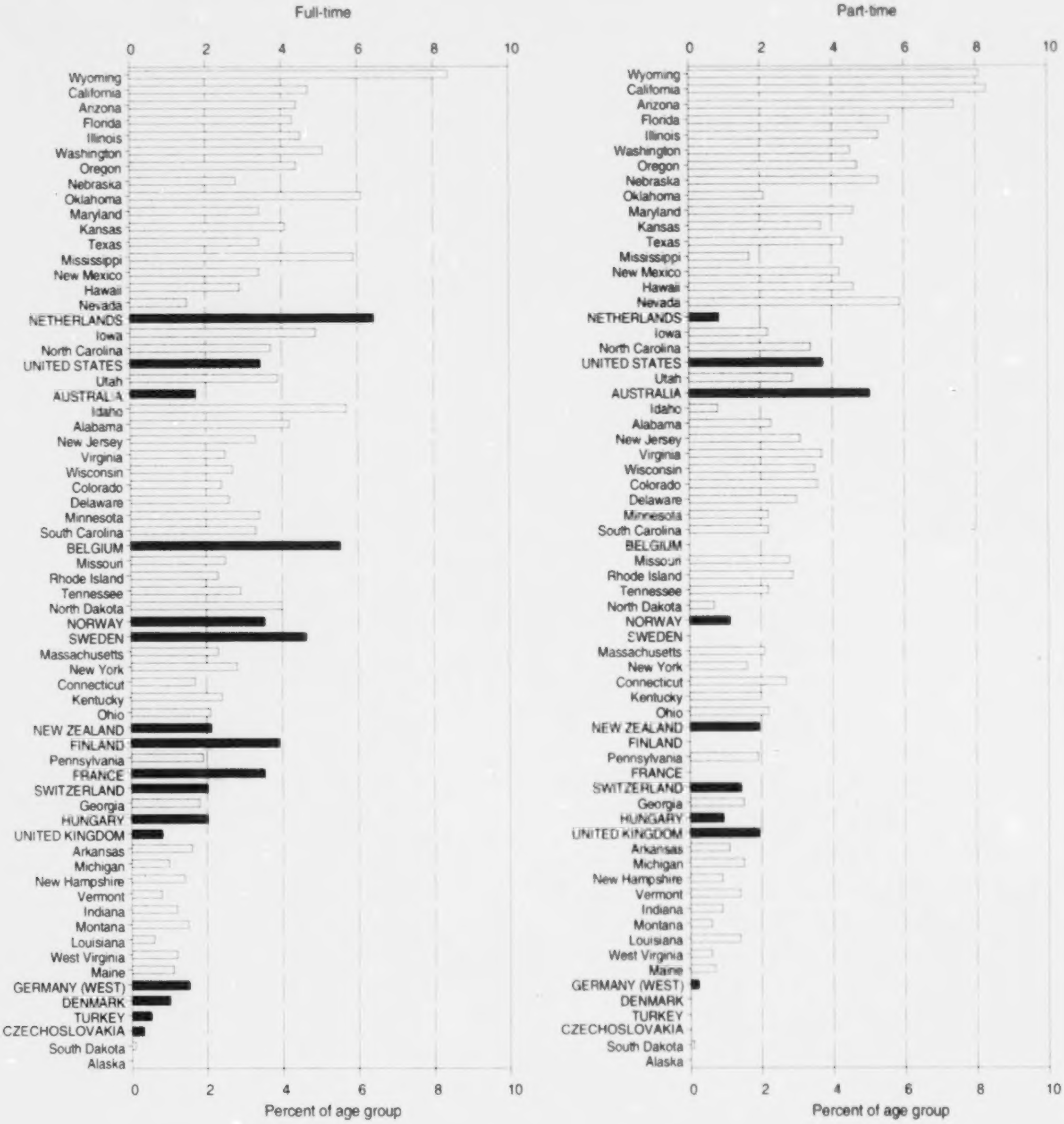
Countries differ greatly in how they classify certain programs as either higher education or upper secondary programs. For example, some programs that are begun subsequent to the completion of general secondary education are classified as non-university higher education in the United States and in parts of Canada, whereas they are defined as upper secondary education in most other countries. (See the supplemental note on levels of education on pages 231–233.)

Figure 12a: Full-time enrollment in public and private non-university higher education among 18- to 29-year-olds, by country and state: 1991



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993, Table P16. U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment Survey, 1991. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

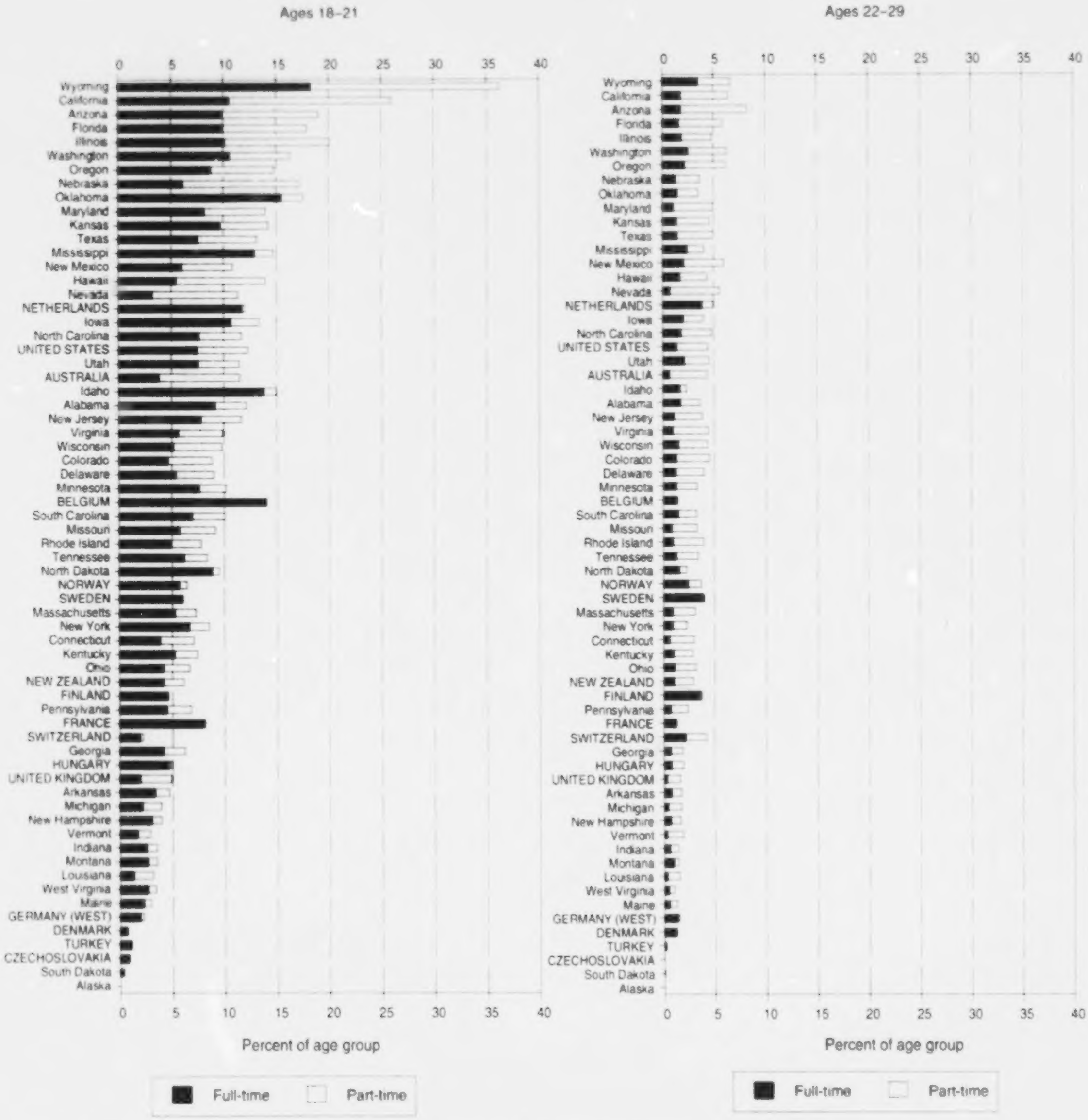
Figure 12b: Enrollment in public and private non-university higher education among 18- to 29-year-olds, by enrollment status, country, and state: 1991



NOTE: States and nations are sorted from high to low based on the sum of the numbers from the two figures.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993, Table P16. U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment, 1991.

Figure 12c: Enrollment in public and private non-university higher education, by age group, enrollment status, country, and state: 1991



NOTE: States and nations are sorted from high to low based on the weighted average of the numbers from the two figures.

SOURCE: *Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a* Glance, 1993, Table P16. U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment, 1991.

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Table 12a: Enrollment in public and private non-university higher education, by age group, enrollment status, and country: 1991

Country	Ages 18-21		Ages 22-29[1]		Total ages 18-29[2]	
	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
Australia	3.8	7.7	0.6	3.7	1.7	5.0
Belgium	14.0	0.0	1.3	0.0	5.5	0.0
Czechoslovakia	0.8	0.0	0.0	0.0	0.3	0.0
Canada	8.1	—	1.8	—	3.9	—
Denmark	0.7	0.0	1.2	0.0	1.0	0.0
Finland	4.6	0.0	3.6	0.0	3.9	0.0
France	8.1	0.0	1.2	0.0	3.5	0.0
Germany (West)	1.9	0.3	1.3	0.2	1.5	0.2
Hungary	4.7	0.2	0.7	1.2	2.0	0.9
Ireland	7.6	—	0.5	—	2.9	—
Netherlands	11.7	0.2	3.8	1.1	6.4	0.8
New Zealand	4.2	1.9	1.0	1.9	2.1	1.9
Norway	5.7	0.7	2.4	1.3	3.5	1.1
Portugal	3.7	—	1.4	—	2.2	—
Sweden	6.0	0.0	3.9	0.0	4.6	0.0
Switzerland	1.9	0.3	2.1	2.0	2.0	1.4
Turkey	1.1	0.0	0.2	0.0	0.5	0.0
United Kingdom	1.9	3.0	0.3	1.3	0.8	1.9
United States	7.5	4.8	1.3	3.1	3.4	3.7

— Not available.

[1] Figures are averages of separate figures provided for the age groups 22-25 and 26-29.

[2] Weighted average of the age groups 18-21 and 22-29.

NOTE: See supplemental note to Indicator 12 on pp. 262-264 for details on data provided by Denmark, France, Hungary, the Netherlands, and the United States, for a discussion of the non-inclusion of proprietary schools, for a discussion of the calculation of full-time equivalent enrollments, and for a discussion of enrollment reference groups and entry reference ages; and on pp. 231-233 for a discussion of levels of education.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table P16.

Table 12b: Enrollment in public and private non-university higher education, by age group, enrollment status, and state: 1991

	Ages 18-21		Ages 22-29		Total ages 18-29*	
State	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
Alabama	9.2	2.9	1.7	2.0	4.2	2.3
Alaska	0.0	0.0	0.0	0.0	0.0	0.0
Arizona	9.9	9.1	1.7	6.5	4.4	7.4
Arkansas	3.4	1.3	0.8	0.9	1.6	1.1
California	10.5	15.5	1.7	4.7	4.7	8.3
Colorado	4.7	4.2	1.2	3.3	2.4	3.6
Connecticut	3.8	3.2	0.6	2.4	1.7	2.7
Delaware	5.4	3.6	1.2	2.7	2.6	3.0
District of Columbia	0.0	0.0	0.0	0.0	0.0	0.0
Florida	9.9	8.0	1.5	4.3	4.3	5.6
Georgia	4.2	2.0	0.7	1.2	1.8	1.5
Hawaii	5.4	8.6	1.6	2.7	2.9	4.6
Idaho	13.8	1.2	1.6	0.6	5.7	0.8
Illinois	10.1	10.0	1.8	3.0	4.5	5.3
Indiana	2.5	0.9	0.6	0.9	1.2	0.9
Iowa	10.7	2.7	2.0	2.0	4.9	2.2
Kansas	9.7	4.5	1.3	3.3	4.1	3.7
Kentucky	5.2	2.2	0.9	1.9	2.4	2.0
Louisiana	1.3	1.9	0.3	1.2	0.6	1.4
Maine	2.3	0.6	0.5	0.7	1.1	0.7
Maryland	8.2	5.8	1.0	4.0	3.4	4.6
Massachusetts	5.3	2.0	0.9	2.2	2.3	2.1
Michigan	2.1	1.8	0.4	1.3	1.0	1.5
Minnesota	7.6	2.5	1.3	2.0	3.4	2.2
Mississippi	12.9	1.8	2.3	1.7	5.9	1.7
Missouri	5.8	3.4	0.8	2.5	2.5	2.8
Montana	2.6	0.8	0.9	0.5	1.5	0.6
Nebraska	6.1	11.1	1.2	2.4	2.8	5.3
Nevada	3.2	8.1	0.7	4.8	1.5	5.9
New Hampshire	3.0	0.9	0.7	1.0	1.4	0.9
New Jersey	7.8	3.9	1.0	2.8	3.3	3.1
New Mexico	6.0	4.9	2.0	3.9	3.4	4.2
New York	6.6	1.9	0.9	1.4	2.8	1.6
North Carolina	7.6	4.0	1.7	3.0	3.7	3.4
North Dakota	8.9	0.7	1.5	0.7	4.0	0.7
Ohio	4.2	2.5	1.1	2.0	2.1	2.2
Oklahoma	15.5	2.1	1.4	2.1	6.1	2.1
Oregon	8.8	6.0	2.1	4.0	4.4	4.7
Pennsylvania	4.5	2.3	0.7	1.6	1.9	1.9
Rhode Island	5.0	2.8	1.0	3.0	2.3	2.9
South Carolina	6.9	3.1	1.5	1.8	3.3	2.2
South Dakota	0.3	0.1	0.0	0.1	0.1	0.1
Tennessee	6.1	2.2	1.2	2.2	2.9	2.2
Texas	7.5	5.6	1.3	3.6	3.4	4.3
Utah	7.5	3.9	2.1	2.5	3.9	2.9
Vermont	1.7	1.2	0.3	1.6	0.8	1.4
Virginia	5.6	4.3	1.0	3.5	2.5	3.7
Washington	10.6	5.8	2.4	3.9	5.1	4.5
West Virginia	2.7	0.7	0.4	0.6	1.2	0.6
Wisconsin	5.2	4.6	1.5	2.9	2.7	3.5
Wyoming	18.3	18.0	3.4	3.2	8.4	8.1

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*Weighted average of the age groups 18-21 and 22-29.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment, 1991. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Indicator 13: University enrollment

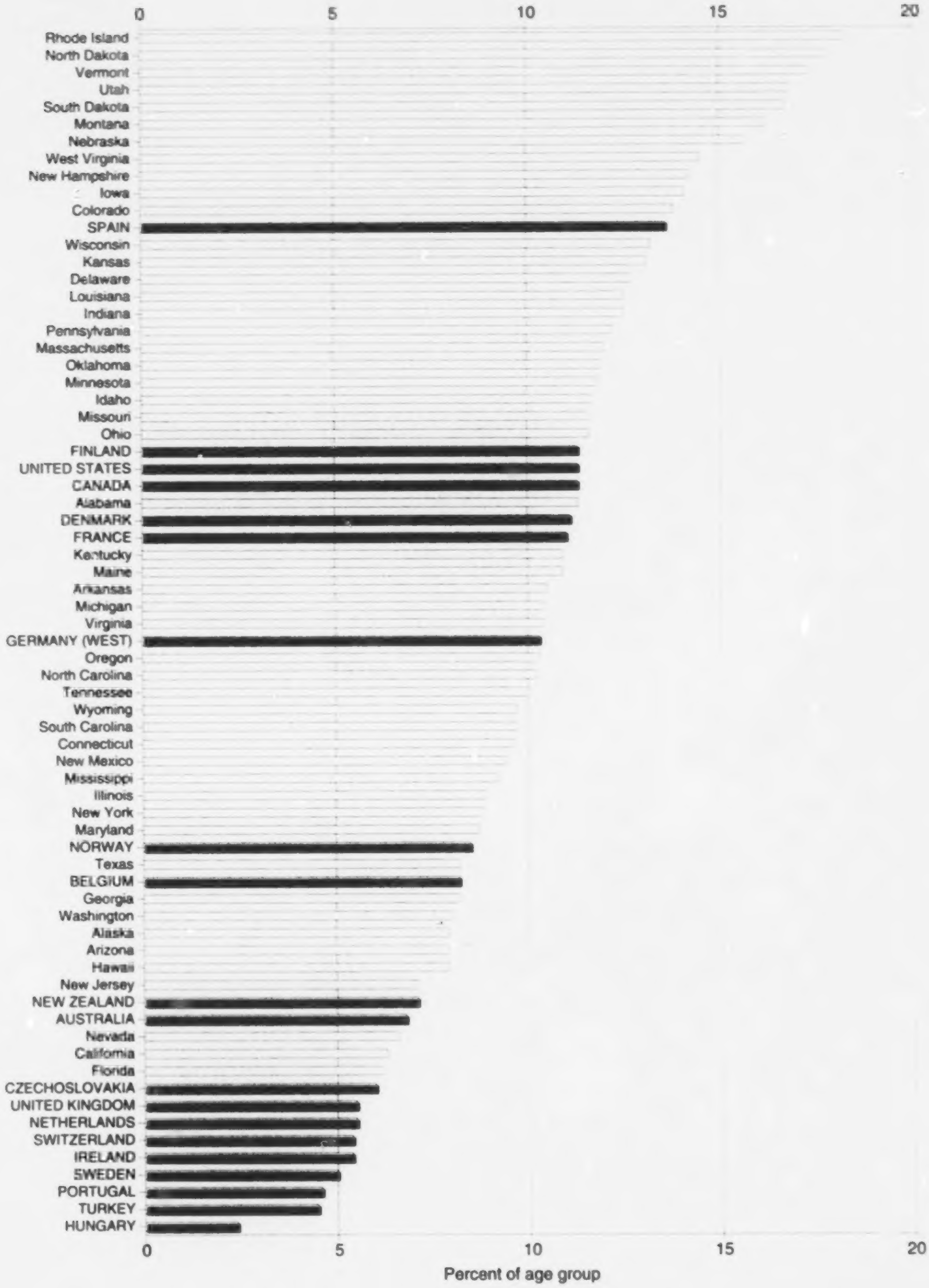
The size of university enrollment reflects the accessibility of university education and the extent to which individuals believe that education provides necessary training for different occupations. A high rate of university enrollment in a country suggests that university education is highly valued and widely available. In other countries, enrollment rates may be low if admission to universities is restricted or if university education is not vital to employment and success in a large number of occupations. This indicator shows the percentage of persons from certain age cohorts (18–21 years, 22–29 years, and 18–29 years) who are students enrolled full-time or part-time at public or private universities. The students may be enrolled in any type of university or four-year college (including undergraduate and graduate education).

- **Among the twenty countries for which data were available in 1991, the United States and Canada recorded the highest full-time enrollment rates for 18- to 21-year-olds (22.8 and 21.6 percent, respectively). Only one other nation (Spain) reported a full-time enrollment rate higher than 20 percent.**

- **In 1991, the U.S. states generally showed higher full-time enrollment rates among 18- to 21-year-olds than did the other countries. Full-time enrollment rates exceeded 20 percent in 36 states, but exceeded this percentage in only 2 other countries.**

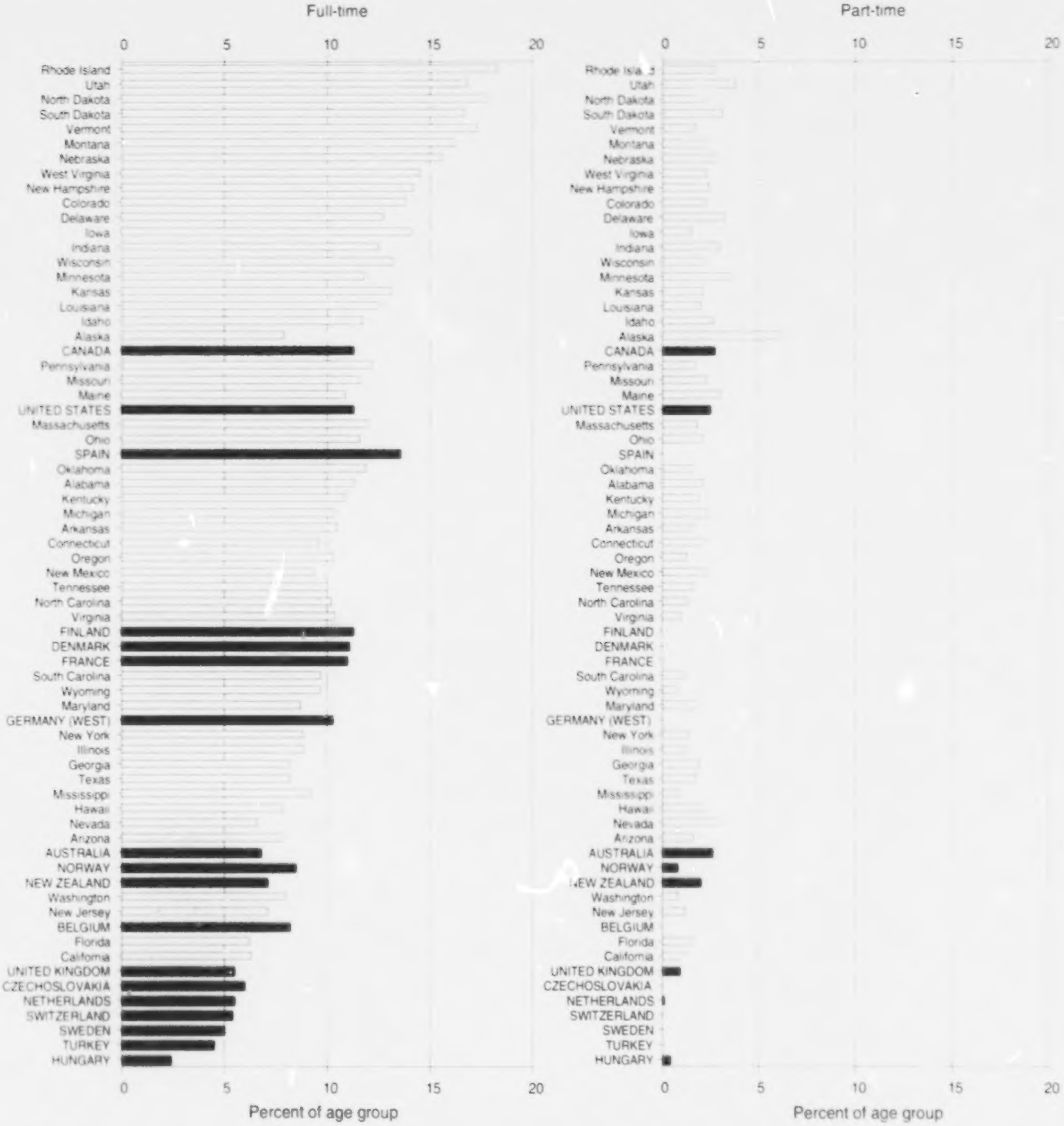
- **Out of all the states and countries included, only Delaware, Alaska, and Australia reported a greater number of students in the 22- to 29-year age group enrolled part-time than full-time. Unlike some of the nations included, every state showed dramatic decline in full-time university enrollment rates as students progressed into the older age group.**

Figure 13a: Full-time enrollment in public and private university education among 18- to 29-year-olds, by country and state: 1991



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table P17. U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment Survey, 1991. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

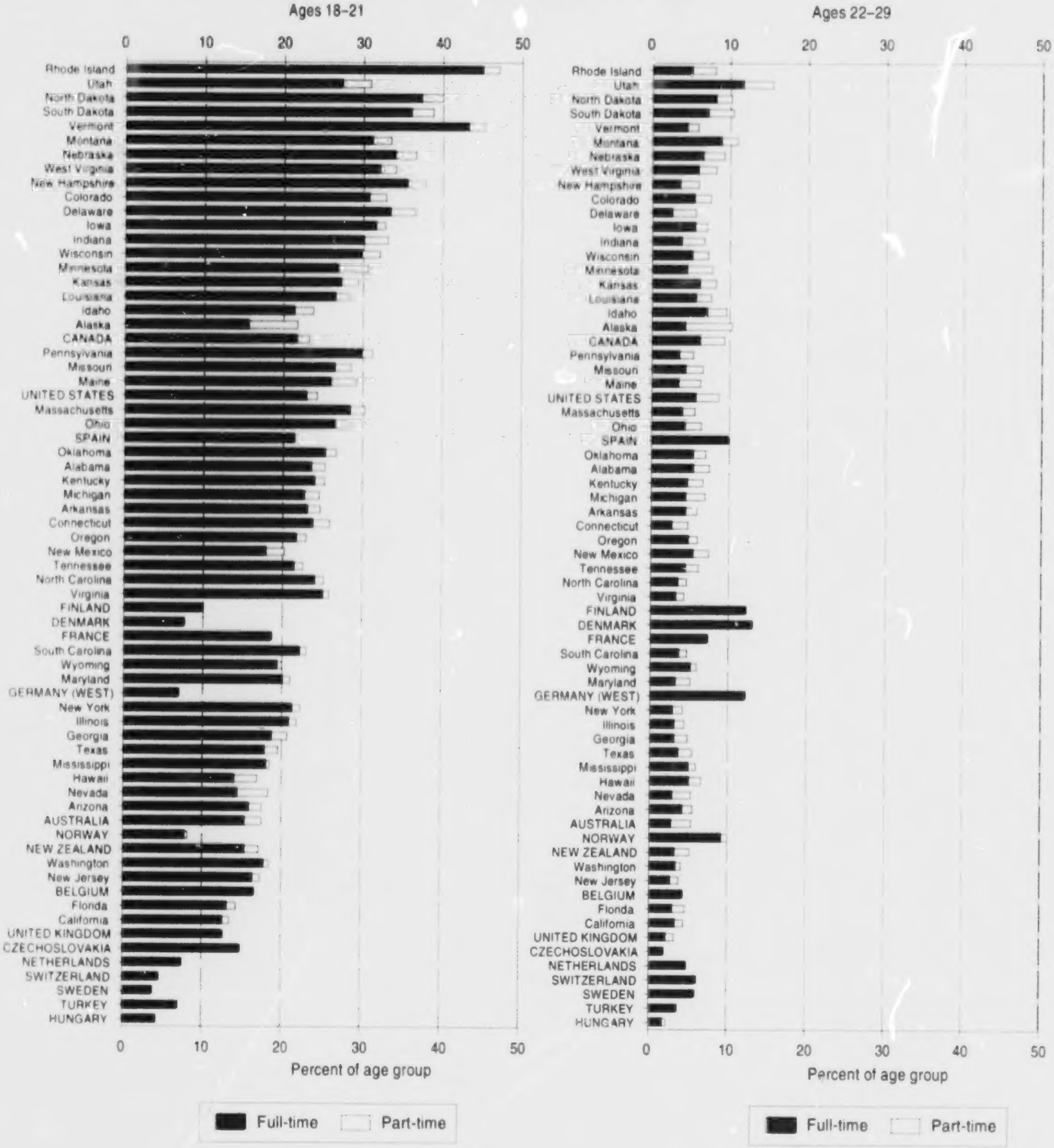
Figure 13b: Enrollment in public and private university education among 18- to 29-year-olds, by enrollment status, country, and state: 1991



NOTE: States and nations are sorted from high to low based on the sum of the numbers from the two columns.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993, Table P17. U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment, 1991.

Figure 13c: Enrollment in public and private university education, by age group, enrollment status, country, and state: 1991



NOTE: States and nations are sorted from high to low based on the weighted average of the numbers from the two figures.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993, Table P17. U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment, 1991.

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Table 13a: Enrollment in public and private university education, by age group, enrollment status, and country: 1991

Country	Ages 18–21		Ages 22–29[1]		Total ages 18–29[2]	
	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
Australia	15.2	2.3	2.6	2.7	6.8	2.6
Belgium	16.4	0.0	4.1	0.0	8.2	0.0
Czechoslovakia	14.7	0.0	1.7	0.0	6.0	0.0
Canada	21.6	1.6	6.1	3.2	11.3	2.7
Denmark	7.5	0.0	12.9	0.0	11.1	0.0
Finland	9.7	0.0	12.1	0.0	11.3	0.0
France	18.5	0.0	7.2	0.0	11.0	0.0
Germany (West)	6.8	0.0	12.0	0.0	10.3	0.0
Hungary	4.1	0.1	1.6	0.6	2.4	0.4
Ireland	12.7	—	1.8	—	5.4	—
Netherlands	7.3	0.0	4.6	0.2	5.5	0.1
New Zealand	15.2	1.9	3.1	2.1	7.1	2.0
Norway	7.6	0.5	9.0	1.0	8.5	0.8
Portugal	7.7	—	3.0	—	4.6	—
Spain	21.3	0.0	9.8	0.0	13.6	0.0
Sweden	3.6	0.0	5.7	0.0	5.0	0.0
Switzerland	4.4	0.0	5.9	0.0	5.4	0.0
Turkey	6.8	0.0	3.4	0.0	4.5	0.0
United Kingdom	12.4	0.3	2.0	1.2	5.5	0.9
United States	22.8	1.4	5.5	3.1	11.3	2.5

— Not available.

[1] Figures are averages of separate figures provided for the age groups 22–25 and 26–29.

[2] Weighted average of the age groups 18–21 and 22–29.

NOTE: See supplemental note to Indicator 13 on pp. 262–264 for details on data provided by Denmark, France, Hungary, the Netherlands, and the United States, for a discussion of the non-inclusion of proprietary schools, for a discussion of the calculation of full-time equivalent enrollments, and for a discussion of enrollment reference groups and entry reference ages; and on pp. 231–233 for a discussion of levels of education.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table P17.

Table 13b: Enrollment in public and private university education, by age group, enrollment status, and state: 1991

	Ages 18-21		Ages 22-29		Total ages 18-29*	
State	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
Alabama	23.4	1.9	5.2	2.2	11.3	2.1
Alaska	15.5	6.2	4.2	6.2	7.9	6.2
Arizona	15.7	1.8	4.0	1.5	7.9	1.6
Arkansas	23.0	1.7	4.3	1.6	10.5	1.6
California	12.5	1.0	3.1	1.3	6.3	1.2
Colorado	30.6	2.2	5.3	2.2	13.8	2.2
Connecticut	23.7	2.3	2.5	2.2	9.6	2.2
Delaware	33.3	3.3	2.5	3.2	12.7	3.2
District of Columbia	44.8	3.9	7.5	3.6	19.9	3.7
Florida	13.0	1.3	2.8	1.8	6.2	1.6
Georgia	18.6	2.1	2.9	1.9	8.2	1.9
Hawaii	13.9	3.0	4.9	1.7	7.9	2.2
Idaho	21.2	2.5	7.0	2.6	11.7	2.6
Illinois	20.7	1.1	3.0	1.4	8.9	1.3
Indiana	30.0	3.1	3.7	3.0	12.5	3.0
Iowa	31.5	1.2	5.4	1.6	14.1	1.5
Kansas	27.2	2.1	6.0	2.1	13.1	2.1
Kentucky	23.8	1.4	4.5	2.1	10.9	1.9
Louisiana	26.4	1.8	5.6	2.0	12.5	2.0
Maine	25.9	3.3	3.4	2.9	10.9	3.0
Maryland	19.9	1.1	3.1	2.1	8.7	1.8
Massachusetts	28.3	1.9	3.8	1.7	12.0	1.8
Michigan	22.6	1.9	4.3	2.6	10.4	2.4
Minnesota	26.8	3.8	4.4	3.4	11.8	3.5
Mississippi	17.9	0.6	4.8	1.0	9.2	0.9
Missouri	26.4	2.1	4.2	2.3	11.6	2.3
Montana	31.1	2.4	8.7	2.2	16.2	2.3
Nebraska	33.9	2.7	6.4	2.8	15.6	2.8
Nevada	14.2	4.0	2.8	2.5	6.6	3.0
New Hampshire	35.4	2.3	3.5	2.5	14.2	2.4
New Jersey	16.2	1.0	2.5	1.2	7.1	1.2
New Mexico	17.7	2.4	5.3	2.1	9.4	2.2
New York	21.1	1.1	2.7	1.5	8.8	1.4
North Carolina	23.9	1.3	3.3	1.3	10.2	1.3
North Dakota	37.2	2.8	8.1	2.0	17.8	2.3
Ohio	26.4	1.9	4.2	2.2	11.6	2.1
Oklahoma	25.2	1.4	5.3	1.6	11.9	1.6
Oregon	21.6	1.4	4.6	1.3	10.3	1.3
Pennsylvania	29.8	1.4	3.4	1.9	12.2	1.7
Rhode Island	44.9	2.1	5.0	3.0	18.3	2.7
South Carolina	22.0	1.0	3.5	1.2	9.7	1.1
South Dakota	36.0	2.8	7.1	3.3	16.7	3.1
Tennessee	21.3	1.2	4.3	1.8	10.0	1.6
Texas	17.7	1.8	3.5	1.9	8.2	1.8
Utah	27.3	3.6	11.5	3.9	16.8	3.8
Vermont	43.2	2.1	4.4	1.4	17.3	1.7
Virginia	25.0	0.8	3.1	1.2	10.4	1.0
Washington	17.6	0.8	3.2	0.8	8.0	0.8
West Virginia	32.0	2.1	5.8	2.4	14.5	2.3
Wisconsin	29.7	2.4	5.0	2.2	13.2	2.2
Wyoming	19.2	0.7	5.0	0.9	9.7	0.8

*Weighted average of the age groups 18-21 and 22-29.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, *Fall Enrollment*, 1991. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

PROCESSES AND INSTITUTIONS INDICATORS

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Indicator 14: Staff employed in education

The most important resource used in education is personnel. This indicator presents the proportion of a country's or state's total labor force that is comprised of "education workers" — teachers and non-teaching staff. It provides a measure of the size of the education system as an employer, relative to the entire labor force. Teachers generally account for about half or more of all staff employed in education. Their role as instructors and evaluators is the most essential in the education enterprise. Teachers are supported, to varying degrees across countries and states, however, by non-teaching personnel, such as school administrators and those employed in ancillary services. Countries vary in the degree to which they include ancillary services and the associated salaries as part of their education budgets. In the United States, for example, school districts commonly provide school-based health services, school cafeterias, pupil transportation, vocational and psychological counseling, building construction and maintenance, and administrative management of the schools; higher education institutions commonly provide dormitories, health clinics, and intercollegiate sports activities. In other countries, few or none of these services are provided by the education authorities but, rather, by non-education public authorities or from private funds. In these other countries, the staff providing these ancillary services would not be counted as non-teaching education staff. Thus, the teaching to non-teaching education staff ratio is likely to be higher in these countries, all else being equal.

- **The five G-7 countries for which data were available recorded similar percentages of teaching staff as a percentage of the total labor force in 1991. In Germany, Japan, and the United Kingdom, teaching staff comprised 2.4 percent of the total labor force, whereas in the United States, teaching staff comprised 2.6 percent of the total labor force.**

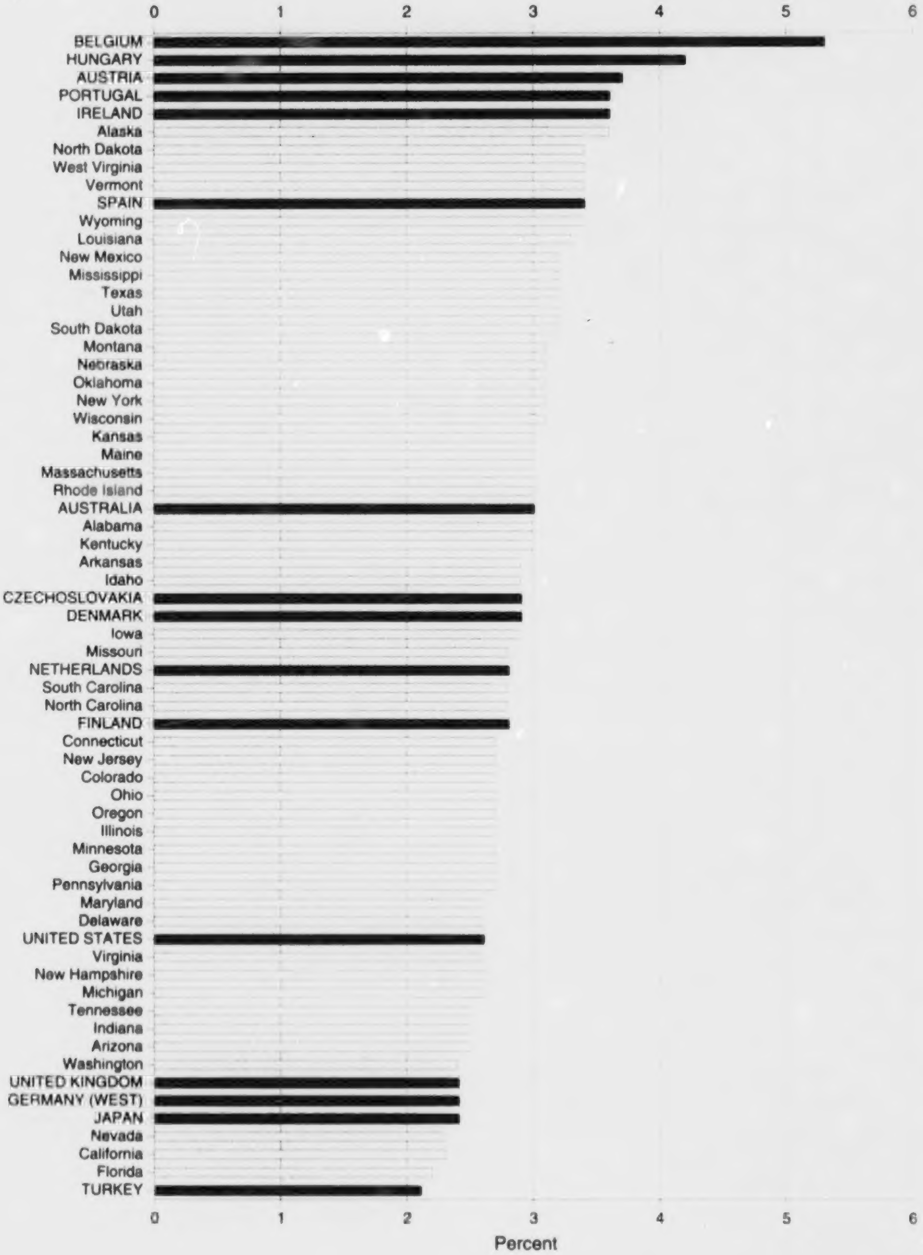
- **The range across countries of the percentage of the total labor force employed in teaching was 3.2 percentage points: from about 2.1 percent in Turkey to 5.3 percent in Belgium. This exceeded the range across states of 1.4 percentage points: from 2.2 percent in Florida to 3.6 percent in Alaska.**

- **For the six countries other than the United States reporting complete data, teaching staff outnumbered non-teaching education staff, giving a ratio of teaching to non-teaching staff of greater than one. For the U.S. states, however, the ratio of teaching to non-teaching staff was greater than one for only 18 of the 49 U.S. states reporting complete data.**

Note on interpretation:

Another major difference across countries in classification procedures lies in the definition of teaching personnel. The United States includes only classroom teachers in this category. Many other OECD countries, including Australia, Austria, Germany, France, and the United Kingdom, however, also include personnel involved in the administration of schools. In cases of assistant principals or other administrative personnel who have some teaching responsibilities, this practice yields results somewhat comparable with the U.S. data. In the case of other administrative staff with no teaching responsibilities, however, accurate comparison cannot be made. It is still unclear exactly which non-teaching administrative personnel are classified as teaching staff in each of the OECD countries, but some include principals and headmasters and some may even include counselors, psychologists, and persons certified as teachers who work in central offices. A study is currently underway to deal with these issues of comparability across countries. Though the comparability problem is less dramatic, there also exists some variation in how states classify personnel and, thus, in how they report these data.

Figure 14: **Teaching staff employed in public and private education as a percentage of the total labor force, by country and state: 1991**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population. U.S. Department of Education, National Center for Education Statistics, *Private Schools in the United States*, Table 4.5; Integrated Postsecondary Education Data System, Fall Staff survey, 1991; *Digest of Education Statistics, 1993*, Table 82; and *Digest of Education Statistics, 1994*, Table 63.

Table 14a: Teaching and non-teaching staff employed in public and private education as a percentage of the total labor force, by type of staff, level of education, and country: 1991

Country	Teaching staff				Non-teaching staff	All education staff
	Primary–secondary	Higher education	Unclassified	All levels		
Australia	2.3	0.6	0.1	3.0	1.2	4.2
Austria	3.0	0.4	0.3	3.7	—	—
Belgium	4.6	0.5	0.2	5.3	1.2	6.5
Czechoslovakia	1.9	0.3	0.7	2.9	—	—
Denmark	2.6	0.2	0.1	2.9	—	—
Finland	—	—	—	2.8	2.4	5.2
France	2.4	—	—	—	—	5.9
Germany (West)	1.6	0.5	0.3	2.4	—	—
Hungary	3.0	0.4	0.8	4.2	2.6	6.7
Ireland	2.8	0.4	0.4	3.6	—	—
Japan	1.7	0.4	0.3	2.4	0.7	3.1
Netherlands	2.1	0.5	0.2	2.8	0.7	3.5
Norway	3.4	—	—	—	—	—
Portugal	3.1	0.3	0.2	3.6	—	—
Spain	2.7	0.4	0.3	3.4	—	—
Sweden	2.5	—	—	—	—	—
Turkey	1.9	0.2	0.0	2.1	—	—
United Kingdom	2.0	0.3	0.1	2.4	—	—
United States	2.1	0.5	0.0	2.6	2.9	5.6

– Not available.

NOTE: Because of rounding, details may not add to totals. See supplemental note to Indicator 14 on pp. 264 for details on data provided by Australia, Denmark, Finland, West Germany and the United States.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table P9.

Table 14b: Teaching and non-teaching staff employed in public and private education as a percentage of the total labor force, by type of staff, level of education, and state: 1991

	Teaching staff				
State	Primary–secondary	Higher education	All levels	Non-teaching staff	All education staff
Alabama	2.4	0.6	3.0	3.9	6.9
Alaska	3.0	0.6	3.6	3.3	6.9
Arizona	2.2	0.3	2.5	2.6	5.1
Arkansas	2.4	0.5	2.9	3.1	6.0
California	1.8	0.4	2.3	2.5	4.8
Colorado	2.1	0.6	2.7	2.7	5.4
Connecticut	2.2	0.5	2.7	2.4	5.1
Delaware	2.1	0.4	2.6	2.7	5.3
District of Columbia	2.8	2.4	5.2	9.5	14.7
Florida	1.9	0.4	2.2	2.2	4.4
Georgia	2.3	0.4	2.7	3.0	5.7
Hawaii	2.2	—	—	1.4	—
Idaho	2.4	0.5	2.9	2.0	4.1
Illinois	2.1	0.6	2.7	2.8	5.5
Indiana	2.2	0.4	2.5	2.5	5.1
Iowa	2.3	0.6	2.9	3.5	6.4
Kansas	2.4	0.6	3.0	3.0	6.0
Kentucky	2.4	0.5	3.0	3.3	6.3
Louisiana	2.8	0.5	3.3	3.5	6.8
Maine	2.6	0.4	3.0	2.5	5.5
Maryland	2.1	0.6	2.6	2.7	5.3
Massachusetts	2.1	0.9	3.0	3.2	6.2
Michigan	2.1	0.5	2.6	3.2	5.7
Minnesota	2.1	0.6	2.7	3.0	5.7
Mississippi	2.7	0.5	3.2	3.4	6.6
Missouri	2.2	0.6	2.8	3.1	5.9
Montana	2.6	0.5	3.1	1.5	4.6
Nebraska	2.5	0.6	3.1	3.2	6.3
Nevada	1.8	0.4	2.3	0.9	3.1
New Hampshire	2.1	0.5	2.6	2.4	5.0
New Jersey	2.4	0.3	2.7	2.6	5.4
New Mexico	2.7	0.5	3.2	4.5	7.7
New York	2.4	0.7	3.1	3.5	6.6
North Carolina	2.1	0.7	2.8	2.9	5.7
North Dakota	2.6	0.8	3.4	3.1	6.5
Ohio	2.2	0.5	2.7	2.8	5.6
Oklahoma	2.6	0.5	3.1	2.9	6.0
Oregon	1.9	0.7	2.7	2.6	5.2
Pennsylvania	2.1	0.6	2.6	3.0	5.7
Rhode Island	2.3	0.7	3.0	2.9	5.9
South Carolina	2.3	0.5	2.8	2.6	5.4
South Dakota	2.7	0.5	3.2	2.4	5.6
Tennessee	2.0	0.5	2.5	3.1	5.6
Texas	2.7	0.5	3.2	2.2	5.5
Utah	2.4	0.7	3.2	3.3	6.5
Vermont	2.6	0.8	3.4	3.4	6.8
Virginia	2.2	0.4	2.6	3.0	5.6
Washington	1.9	0.5	2.4	2.4	4.7
West Virginia	2.8	0.6	3.4	3.0	6.4
Wisconsin	2.4	0.7	3.1	2.7	5.8
Wyoming	2.8	0.6	3.4	3.3	6.7

— Not available.

NOTE: Because of rounding, details may not add to totals. Data for public primary–secondary school staffing include imputations for Montana and Nevada. The number of other staff in private primary and secondary schools are imputed from national ratio of teaching to other staff in private schools. See supplemental note to Indicator 14 on p. 264 for details on the characteristics of the state-level data.

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population. U.S. Department of Education, National Center for Education Statistics, *Private Schools in the United States*, Table 4.5; Integrated Postsecondary Education Data System, Fall Staff survey, 1991; *Digest of Education Statistics, 1993*, Table 82; and *Digest of Education Statistics, 1994*, Table 63.

Indicator 15: Number of schools and school size

A nation or state may have a large number of schools and a small average school size because of a dispersed population, or because of some other, deliberate policy. Schooling could be compartmentalized by level (e.g., preprimary, primary, lower secondary, upper secondary) or by curricular theme (e.g., academic, vocational). These levels and themes may be separated by school or combined. The more they are kept separate, the greater the number of individual schools and the smaller the average school size. Some educators believe there is a negative association between large school size and student achievement and, therefore, encourage a reduction in the number of students per school. On the other hand, though smaller schools may have a stronger sense of community, larger schools often can provide broader curricular offerings.

- **Of the G-7 countries for which data are available for various years between 1989 and 1993, the United States and Japan had the largest average number of students per school at the preprimary through secondary level (398 and 395, respectively). The average for France (166), the G-7 country with the smallest number of students per school, was less than half that of the United States.**

- **The average number of students per preprimary through secondary school in Taiwan (873), the country with the largest number of students per school, was over five times greater than that of Finland (156), the country with the smallest average school size at the same level.**

- **For the most part, the schools in the U.S. states at the preprimary through secondary level were larger than those in other countries. Schools in 28 states, but only 2 of 13 countries, averaged above 400 students.**

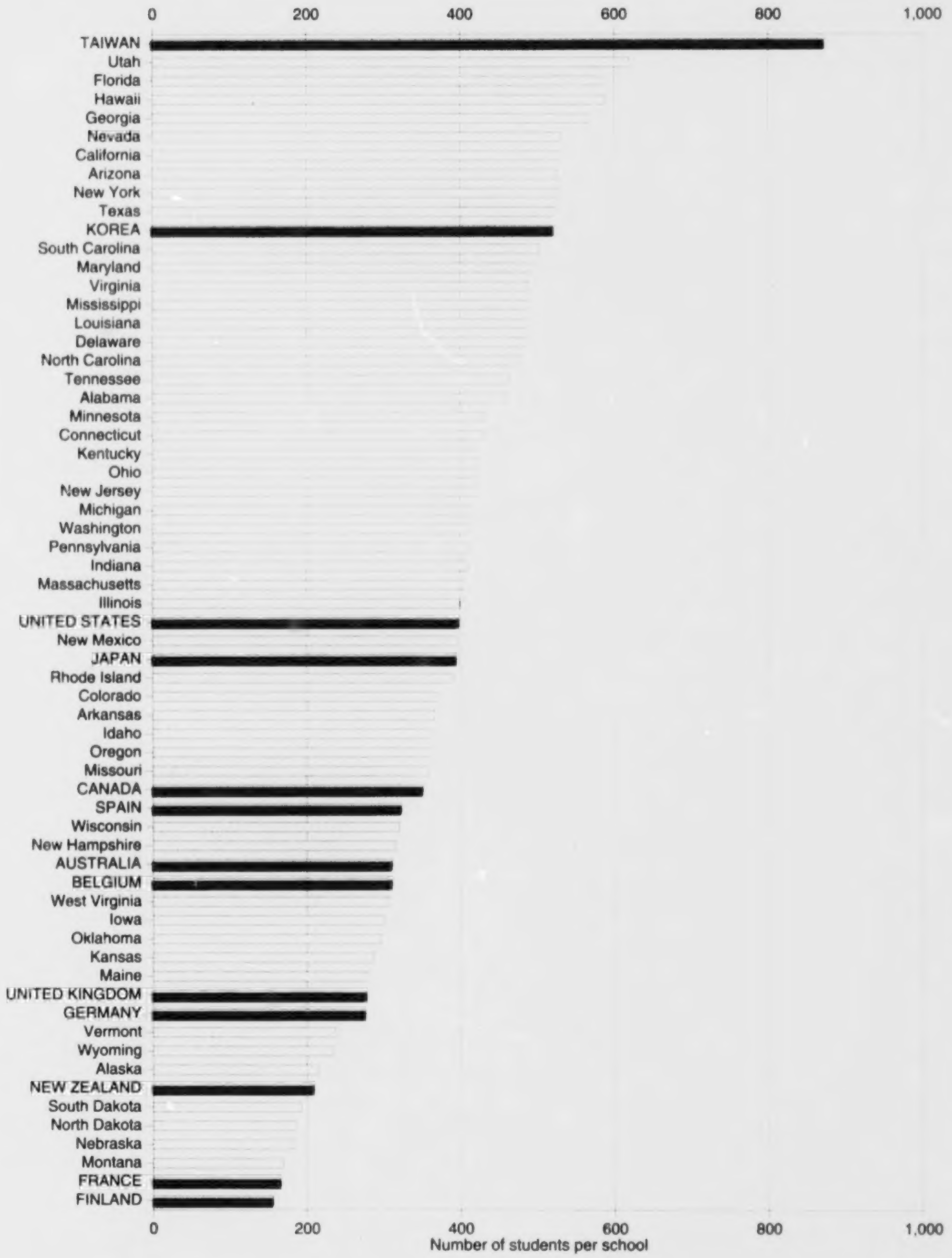
- **Of the five G-7 countries included in various years between 1987 and 1993, the average number of students per higher education institution in the United States (3,988) was second only to Germany (5,660) and greater than those of Japan (2,327), France (2,636), and Canada (3,769). Germany, Korea, and Taiwan were the only countries, among the eleven for whom data were available, with averages above 5,000. Korea's average (5,779) was almost eight times that of Belgium (728), the country with the smallest number of students per institution.**

- **The U.S. states generally had higher average numbers of students per higher education institution than did the other countries. Five states, but none of the countries, had averages above 6,000 students per institution; whereas half of the other countries, but only 14 of the states, had averages below 3,000 students per institution.**

Note on interpretation:

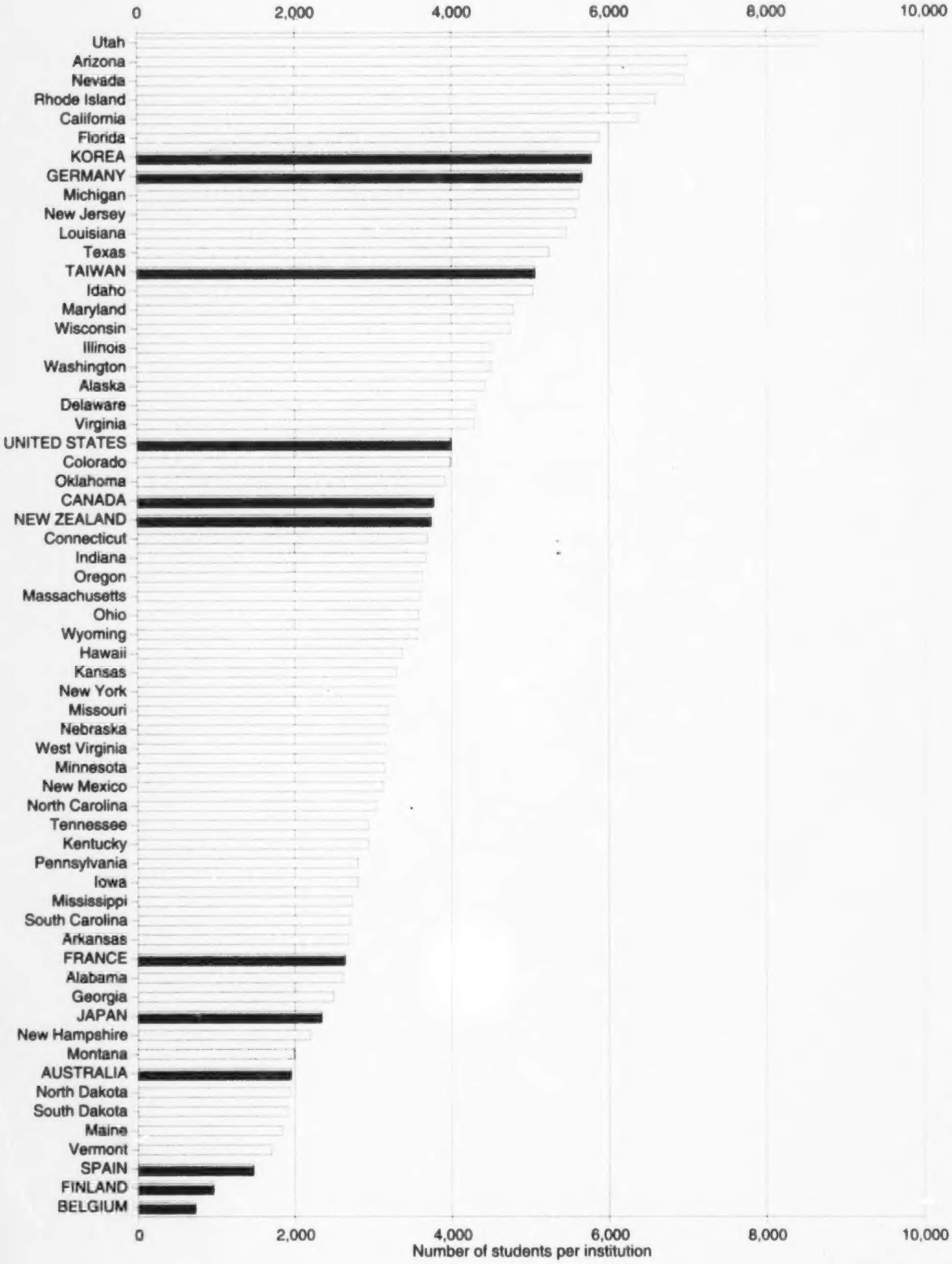
There are marked differences among countries with respect to whether certain programs are classified as belonging to the university, non-university, or upper secondary sector. For example, in some countries, programs leading to qualifications in teaching and nursing are considered to be university programs; in others, they are non-university programs. Furthermore, some vocational and technical programs are classified as non-university higher education in parts of Canada and the United States, whereas they are defined as upper secondary education in most other countries.

Figure 15a: Average number of students per school in preprimary to secondary schools, by country and state: Various years



SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, Tables 44 and 95; *Digest of Education Statistics, 1994*, Table 63; *Detailed Characteristics of Private Schools and Staff*, 1987–88, Table 3.1. Asia Pacific Economic Cooperation, *Education Profiles.* United Nations' Educational, Scientific, and Cultural Organization, *Statistical Yearbook*, 1992. Various country data.

Figure 15b: Average number of students enrolled per institution of higher education, by country and state: Various years



SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, Table 192; *Digest of Education Statistics, 1992*, Table 227; Asia Pacific Economic Cooperation, *Education Profiles*. Various country sources.

Table 15a: Number of public and private schools, number of students, and average number of students per school in preprimary through secondary schools, by level and country: Various years

		Number of schools				Preprimary–secondary students (in thousands)	Average number of students per school
Country	Year	Preprimary –primary	Secondary	Combined preprimary –secondary	Total		
Australia	1992	7,086	1,617	1,254	9,957	3,099	311
Belgium*	1990-91	1,878	692	—	2,570	799	311
Canada	1989	—	—	—	14,300	5,020	351
Finland	1993	—	820	4,610	5,430	849	156
France	1991-92	62,119	11,306	—	73,425	12,219	166
Germany	1991	19,877	16,172	580	36,629	10,119	276
Japan	1989	39,903	16,781	—	56,684	22,376	395
Korea	1990	14,689	4,198	—	18,887	9,867	522
New Zealand	1990	2,917	253	146	3,316	692	209
Spain	1990-91	20,517	5,370	—	25,887	8,369	323
Taiwan	1991-92	4,432	975	—	5,396	4,711	873
United Kingdom	1991-92	25,338	4,731	2,488	32,557	9,049	278
United States	1991-92	78,078	26,510	3,269	107,857	42,964	398

— Not available.

*French Community only.

NOTE: Private school data included in U.S. figures for the number of schools by level are adjusted using national percentages of public school distribution by level. See supplemental note to Indicator 15 on pp. 264-272 for details on data, including their sources, for all countries, Australia, Belgium (French Community), Canada, Finland, France, Germany, Japan, Korea, New Zealand, Spain, Taiwan, the United Kingdom, and the United States, and on pp. 231-233 for a discussion of levels of education.

SOURCE: Asia Pacific Economic Cooperation, *Education Profiles*. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, Tables 44 and 95; *Digest of Education Statistics, 1994*, Table 63. United Nations' Educational, Scientific, and Cultural Organization, *Statistical Yearbook*, 1992. Various country sources — see supplemental note to Indicator 15 on pp. 264-272 for a listing.

Table 15b: Number of public and private schools, number of students, and average number of students per school in preprimary through secondary schools, by level and state: 1991

State	Number of schools: Preprimary –primary	Secondary	Combined preprimary –secondary	Total	Preprimary–secondary students (in thousands)	Average number of students per school
Alabama	1,102	370	210	1,682	775	461
Alaska	228	103	242	572	123	215
Arizona	972	320	17	1,309	689	526
Arkansas	758	482	9	1,250	458	366
California	7,860	2,643	219	10,722	5,668	529
Colorado	1,232	447	18	1,696	629	371
Connecticut	981	283	21	1,286	553	430
Delaware	170	60	25	255	124	486
District of Columbia	182	67	6	255	104	408
Florida	2,602	605	437	3,643	2,151	590
Georgia	1,744	424	62	2,230	1,262	566
Hawaii	277	68	14	359	211	588
Idaho	417	220	13	650	236	363
Illinois	4,144	1,230	32	5,406	2,156	399
Indiana	1,893	605	54	2,552	1,047	410
Iowa	1,261	554	27	1,842	552	300
Kansas	1,182	492	1	1,675	480	287
Kentucky	1,264	417	0	1,681	715	425
Louisiana	1,288	418	145	1,851	902	487
Maine	658	161	13	831	233	280
Maryland	1,402	305	26	1,732	856	494
Massachusetts	1,908	467	36	2,411	971	403
Michigan	3,204	987	86	4,277	1,781	416
Minnesota	1,342	659	17	2,018	870	431
Mississippi	743	295	110	1,148	559	487
Missouri	1,861	735	66	2,662	951	357
Montana	602	403	1	1,006	170	169
Nebraska	1,254	431	28	1,713	316	184
Nevada	311	98	10	419	222	530
New Hampshire	492	132	6	630	199	316
New Jersey	2,543	596	4	3,144	1,328	422
New Mexico	644	212	8	863	342	396
New York	4,347	1,386	247	5,980	3,141	525
North Carolina	1,814	534	47	2,396	1,146	478
North Dakota	412	259	4	676	125	185
Ohio	3,465	1,246	128	4,839	2,047	423
Oklahoma	1,347	706	0	2,053	608	296
Oregon	1,093	330	49	1,473	532	361
Pennsylvania	3,778	1,172	53	5,003	2,054	411
Rhode Island	337	81	4	422	165	391
South Carolina	1,019	328	13	1,360	684	503
South Dakota	439	328	0	767	148	193
Tennessee	1,433	445	73	1,951	907	465
Texas	4,927	1,632	444	7,003	3,664	523
Utah	509	226	12	747	463	620
Vermont	361	65	17	443	105	237
Virginia	1,726	465	28	2,219	1,083	488
Washington	1,518	613	121	2,252	934	415
West Virginia	787	262	30	1,079	331	307
Wisconsin	2,164	787	24	2,974	953	320
Wyoming	309	134	2	445	104	234

NOTE: Private school data for number of schools by level included in state figures are adjusted using national percentages of public school distribution by level. See supplemental note to Indicator 15 on pp. 264–272 for further details.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1993, Tables 44 and 95; *Digest of Education Statistics*, 1994, Table 63.

Table 15c: Number of public and private higher education institutions, number of students enrolled, and average number of students per institution, by level and country: Various years

Country	Year	Number of higher education institutions: Non-university	University	Total	Students enrolled in higher education (in thousands)	Average number of students per institution of higher education
Belgium*	1990-91	142	9	151	110	728
Canada	1987	102	127	229	863	3,769
Finland	1993	175	21	196	188	959
France	1990-91	407	77	484	1,276	2,636
Germany	1991	217	98	315	1,783	5,660
Japan	1988	63	490	1,123	2,613	2,327
Korea	1990	151	107	258	1,491	5,779
New Zealand	1990	31	7	38	142	3,737
Spain	1989-90	—	—	743	1,093	1,471
Taiwan	1991-92	75	46	121	612	5,058
United States	1991-92	1,444	2,157	3,601	14,360	3,988

— Not available.

*French Community only.

NOTE: See Glossary for definitions of university and non-university institutions. See supplemental note to Indicator 15 on pp. 264-272 for details on data, including their sources, for all countries, Australia, Belgium (French Community), Finland, France, Germany, Japan, Korea, Spain, Taiwan, and the United Kingdom; and on pp. 231-233 for a discussion of levels of education.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1992*, Table 227; *Digest of Education Statistics, 1993*, Table 192. Asia Pacific Economic Cooperation, *Education Profiles*. Various country sources — see supplemental note to Indicator 15 on pp. 264-272 for a listing.

Table 15d: Number of public and private higher education institutions, number of students enrolled, and average number of students per institution, by level and state: 1991–1992

State	Number of higher education institutions: Non-university	Number of higher education institutions: University	Number of higher education institutions: Total	Students enrolled in higher education in thousands)	Average number of students per institution of higher education
Alabama	50	36	86	224	2,609
Alaska	1	6	7	31	4,429
Arizona	21	18	39	273	7,000
Arkansas	15	20	35	94	2,686
California	140	178	318	2,024	6,365
Colorado	25	34	59	235	3,985
Connecticut	19	26	45	166	3,689
Delaware	3	7	10	43	4,299
District of Columbia	0	17	17	78	4,588
Florida	45	59	104	612	5,885
Georgia	61	50	111	277	2,495
Hawaii	7	10	17	57	3,371
Idaho	4	7	11	55	5,036
Illinois	65	102	167	753	4,509
Indiana	25	54	79	290	3,671
Iowa	23	38	61	171	2,804
Kansas	22	29	51	168	3,294
Kentucky	30	34	64	188	2,938
Louisiana	10	26	36	197	5,472
Maine	11	20	31	57	1,844
Maryland	22	34	56	268	4,784
Massachusetts	30	86	116	419	3,612
Michigan	37	64	101	568	5,624
Minnesota	37	44	81	255	3,148
Mississippi	25	21	46	125	2,725
Missouri	26	67	93	297	3,194
Montana	10	9	19	38	1,991
Nebraska	14	22	36	114	3,167
Nevada	6	3	9	63	6,963
New Hampshire	11	18	29	64	2,197
New Jersey	24	36	60	335	5,583
New Mexico	18	12	30	94	3,133
New York	95	226	321	1,056	3,290
North Carolina	69	53	122	372	3,049
North Dakota	10	10	20	39	1,937
Ohio	67	92	159	569	3,579
Oklahoma	21	26	47	184	3,915
Oregon	14	32	46	167	3,630
Pennsylvania	76	145	221	620	2,805
Rhode Island	1	11	12	79	6,593
South Carolina	27	34	61	165	2,705
South Dakota	2	17	19	36	1,912
Tennessee	29	52	81	238	2,938
Texas	78	97	175	917	5,240
Utah	8	7	15	130	8,667
Vermont	4	18	22	37	1,702
Virginia	35	48	83	356	4,289
Washington	33	28	61	275	4,508
West Virginia	6	22	28	89	3,164
Wisconsin	23	42	65	309	4,754
Wyoming	8	1	9	32	3,569

NOTE: See Glossary for definitions of university and non-university institutions.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics 1993*, Table 192; *Digest of Education Statistics, 1992*, Table 227; Integrated Postsecondary Education Data System, *Institutional Characteristics*, 1992-93.

Indicator 16: Class size

The number of students a teacher faces during a period of instruction — measured as class size — is an indicator of the typical teacher's pupil load during a class period. Smaller class sizes are sometimes valued because they may allow students to receive more personalized attention from their teachers and may reduce the teachers' burden of managing large numbers of pupils and their work. However, maintaining smaller class sizes can be more expensive. Furthermore, large classes do not necessarily hinder instruction. Depending on teaching style, student behavior, and other factors such as the opportunity for students to meet with teachers outside of class, large classes may function just as efficiently as small ones. Because this indicator measures *average* class size, it does not reveal whether schools choose to have different-sized classes for different subjects or different levels of education.

- **In 1991, average lower secondary class sizes in the G–7 countries included here all fell within the range of 20 to 25 students per class. The United States had an average class size of 23 students per class.**
- **Other countries reported a wide range of average class sizes, from 18 in Switzerland to 49 in Korea. While no state had an average class size larger than 30, 5 of the other 18 countries did.**

Note on interpretation:

State data are based on the size of classes reported by 8th-grade public school teachers. Data for countries, including the U.S. average, were obtained as follows: Administrators from schools with 13-year-old students who participated in the International Assessment of Educational Progress estimated the modal size for a class at the grade level to which most 13-year-olds would be assigned.

Figure 16: Average lower secondary class size, by country and state:

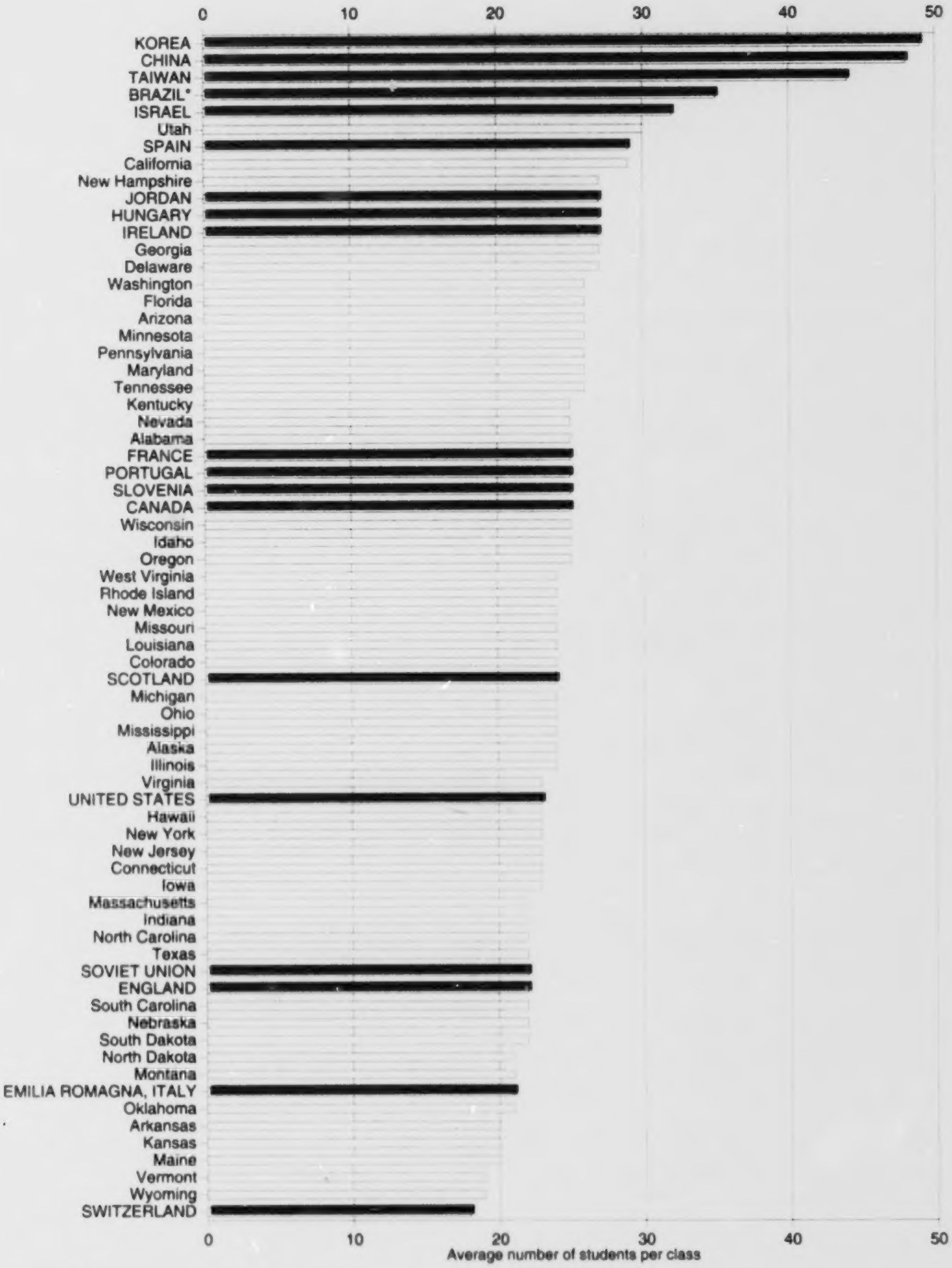


*Figure represents the unweighted average of two cities, São Paulo and Fortaleza.

NOTE: State data are based on the size of classes reported by 8th-grade public school teachers. Data for countries, including the U.S. average, were obtained as follows: Administrators from schools with 13-year-old students who participated in the International Assessment of Educational Progress estimated the modal size for a class at the grade level to which most 13-year-olds would be assigned.

SOURCE: Educational Testing Service, International Assessment of Educational Progress *Learning Mathematics*, Figure 5.2. U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1990–91.

Table 16a: Average class size at grade level to which most 13-year-old students are assigned, according to school administrators, by country: 1991

Country	Average class size
São Paulo and Fortaleza, Brazil	35
Canada	25
China	48
England	22
France	25
Hungary	27
Ireland	27
Israel	32
Emilia Romagna, Italy	21
Jordan	27
Korea	49
Portugal	25
Scotland	24
Slovenia	25
Soviet Union	22
Spain	29
Switzerland	18
Taiwan	44
United States	23

NOTE: See supplemental note to Indicator 16 on pp. 272–278 for details on data and sample sizes from Canada, Emilia Romagna (Italy), England, Israel, Portugal, Scotland, the Soviet Union, Spain, Switzerland, and the United States; and for discussions of the calculation of class size and of the International Assessment of Educational Progress (IAEP).

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, Figure 5.2.

Table 16b: Average class size according to 8th grade public school teachers, by state: 1990–1991

State	Average class size
Alabama	25
Alaska	24
Arizona	26
Arkansas	20
California	29
Colorado	24
Connecticut	23
Delaware	27
District of Columbia	22
Florida	26
Georgia	27
Hawaii	23
Idaho	25
Illinois	24
Indiana	22
Iowa	23
Kansas	20
Kentucky	25
Louisiana	24
Maine	20
Maryland	26
Massachusetts	22
Michigan	24
Minnesota	26
Mississippi	24
Missouri	24
Montana	21
Nebraska	22
Nevada	25
New Hampshire	27
New Jersey	23
New Mexico	24
New York	23
North Carolina	22
North Dakota	21
Ohio	24
Oklahoma	21
Oregon	25
Pennsylvania	26
Rhode Island	24
South Carolina	22
South Dakota	22
Tennessee	26
Texas	22
Utah	30
Vermont	19
Virginia	23
Washington	26
West Virginia	24
Wisconsin	25
Wyoming	19

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1990–91.

Indicator 17: Student use of technology

The forms of technology utilized in schools can affect both the types of skills taught in the classroom and the potential for academically sophisticated assignments and exercises. For example, in math courses in which calculators are used, students can spend more time solving complex and challenging problems and less on doing routine computations by hand. Likewise, students with access to computers can generate and edit work more efficiently and, thus, potentially free time to master higher levels of writing skill. Needless to say, student use of technology is affected by its availability. Therefore, varying levels of resources among countries and nations factor significantly into this measure.

- **In 1991, 54 percent of students in the United States reported using calculators in school, a proportion that fell mid-range among all the countries included here. Ninety percentage points separated the country with the highest rate of calculator usage (France) and the countries with the lowest rate (Korea and Brazil). Half of all the nations providing data reported percentages of less than 50 percent.**

- **When students in the U.S. states were asked about calculator use, they also reported considerable variation. The range extended from 47 percent in Mississippi, the state with the lowest use of calculators in school, to 88 percent in Maine, the state with the highest use.**

- **The United States was also in the middle of the range of countries in the proportion of students using computers for school work or homework (37 percent). Slovenia and France had the highest percentages, 61 and 57 percent, while several countries had about 5 percent. Slovenia's rate was 24 percentage points higher than that of the United States. The difference between Slovenia's rate and that of São Paulo and Fortaleza, Brazil, with the lowest percentage, was 57 percentage points.**

- **Even the U.S. state with the lowest rate had a higher percentage of students using computers for school work or homework than did half of the countries included here. No state had a rate of less than 25 percent, whereas nine nations did. Students in Maine matched those of Slovenia in the highest rate of computer usage among all the nations and states (61 percent).**

Figure 17: **Percentage of 13-year-old students (in countries) and public school 8th-graders (in states) who report they sometimes use computers for school work or homework, by country (1991) and state (1992)**

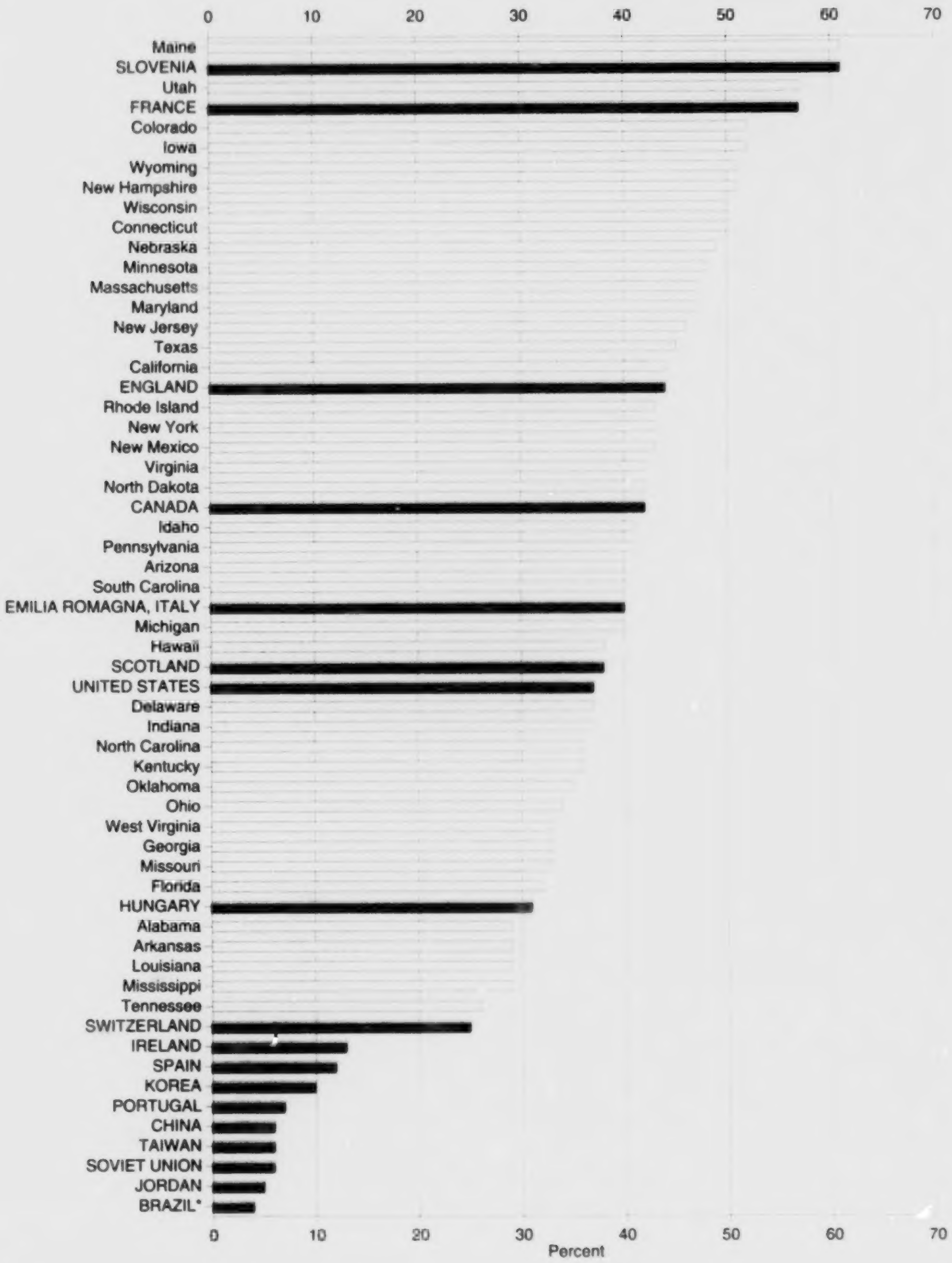


*Figure represents the unweighted average of two cities, São Paulo and Fortaleza.

NOTE: Data for the states of Alaska, Illinois, Kansas, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington are not available because they did not participate in the survey.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States*, Table 10.23. Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, Figure 3.4.

Table 17a: Percentage of 13-year-old students who report they sometimes use calculators in school or computers for school work or homework, by country: 1991

Country	Percent who use calculators	Percent who use computers
São Paulo and Fortaleza, Brazil	4	4
Canada	75	42
China	7	6
England	90	44
France	94	57
Hungary	71	31
Ireland	25	13
Emilia Romagna, Italy	64	40
Jordan	5	5
Korea	4	10
Portugal	19	7
Scotland	82	38
Slovenia	46	61
Soviet Union	19	6
Spain	45	12
Switzerland	51	25
Taiwan	62	6
United States	54	37

NOTE: Differences exist in the wording of the question regarding calculator use and in the samples of students questioned that may account for a difference in results between the United States' averages on the two questionnaire administrations, the IAEP and the NAEP. See supplemental note to Indicator 17 on pp. 272–278 for details on data and sample sizes from Canada, Emilia Romagna (Italy), England, Israel, Portugal, Scotland, the Soviet Union, Spain, Switzerland, and the United States; and for discussions of students' use of computers and calculators, the International Assessment of Educational Progress (IAEP), the National Assessment of Educational Progress (NAEP), and comparing questionnaire results of the IAEP and the NAEP.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, Figure 3.4.

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Table 17b: Percentage of 8th-grade public school students who report they sometimes use calculators in math class or computers for school work or homework, by state: 1992

State	Percent who use calculators	Percent who use computers
Alabama	66	29
Arizona	67	40
Arkansas	59	29
California	73	44
Colorado	83	52
Connecticut	74	50
Delaware	74	37
District of Columbia	75	46
Florida	62	32
Georgia	67	33
Hawaii	66	38
Idaho	82	41
Indiana	62	37
Iowa	82	52
Kentucky	84	36
Louisiana	60	29
Maine	88	61
Maryland	72	47
Massachusetts	52	47
Michigan	82	40
Minnesota	87	48
Mississippi	47	29
Missouri	85	33
Nebraska	82	49
New Hampshire	81	51
New Jersey	68	46
New Mexico	66	43
New York	51	43
North Carolina	66	36
North Dakota	81	42
Ohio	71	34
Oklahoma	52	35
Pennsylvania	62	41
Rhode Island	66	43
South Carolina	66	40
Tennessee	60	26
Texas	78	45
Utah	79	57
Virginia	63	42
West Virginia	64	33
Wisconsin	85	50
Wyoming	82	51

NOTE: The states of Alaska, Illinois, Kansas, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington did not participate in the 1992 NAEP Trial State Assessment, the source for these data. Differences exist in the wording of the question regarding calculator use and in the samples of students questioned that may account for difference in results between the United States' averages on the two questionnaire administrations, the IAEP and the NAEP. See technical note for Indicator 17 on pp. 272-278 for an explanation of the difficulties inherent in comparing results between the two administrations.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States,* Tables 10.15 and 10.23.

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Indicator 18: Student time spent doing homework and watching television

How students occupy their time outside of school can affect their academic performance. Since homework is a form of practice or self-directed study, most educators feel that it improves student achievement. Empirical studies conducted on the subject, moreover, suggest that the amount of time spent on homework is positively related to academic achievement. However, statistics concerning the average number of hours spent on homework tell us little about the quality of the homework assigned or the effort and care students take in completing it. For many students, homework must compete with television for their attention. If students spend a lot of time watching television, little time is left to focus on academic studies. This indicator documents how students spend their time at home through two measures — the percentage of students who claim to do 2 hours or more of homework daily, and the percentage of students who report watching television one hour or less daily. Data for these two measures are based on the responses of 13-year-old students in the countries and 8th-grade public school students in the states.

- **In 1991, 13-year-old students in the United States did less homework each day than their counterparts in most of the other countries for which we have data. Only Scotland and Switzerland, of the 18 other countries represented here, reported a lower percentage of students doing 2 hours or more of homework a day than did the United States.**

- **In 1992, the percentage of students indicating they do 2 or more hours of homework daily was generally lower in the U.S. states than in the other countries for which data were available. In twelve of 18 other countries, more than 4 out of 10 13-year-olds reported doing that much homework; whereas none of the 41 states had that many. The range across the states was much more narrow than that across the countries, with a difference of only 15 percentage points separating Connecticut and Massachusetts (34 percent) and Iowa (19 percent). The range across countries extended 65 percentage points between Emilia Romagna, Italy (79 percent) and Scotland (14 percent).**

- **Of 18 other countries reporting data, only Scotland had a higher proportion of students report watching 2 hours or more of TV daily than did the United States. The percentage for China (35 percent), the country with the lowest percentage of students who watched television 2 hours or more daily, was 49 percentage points lower than that of the United States (84 percent).**

- **On the whole, a higher proportion of students in the U.S. states watched television for 2 hours or more daily than did students in other countries reporting data. Twelve countries, but only three states, had percentages lower than 80. The range across the countries was much wider than that across the states. The countries reported a range of 55 percentage points, while the states showed a difference of only 18 percentage points between the states with the lowest (Utah) and highest (Alabama, Mississippi, Louisiana, and Arkansas) percentages.**

Figure 18a: **Percentage of 13-year-old students (in countries) and public school 8th-graders (in states) who report doing 2 hours or more of homework daily, by country (1991) and state (1992)**

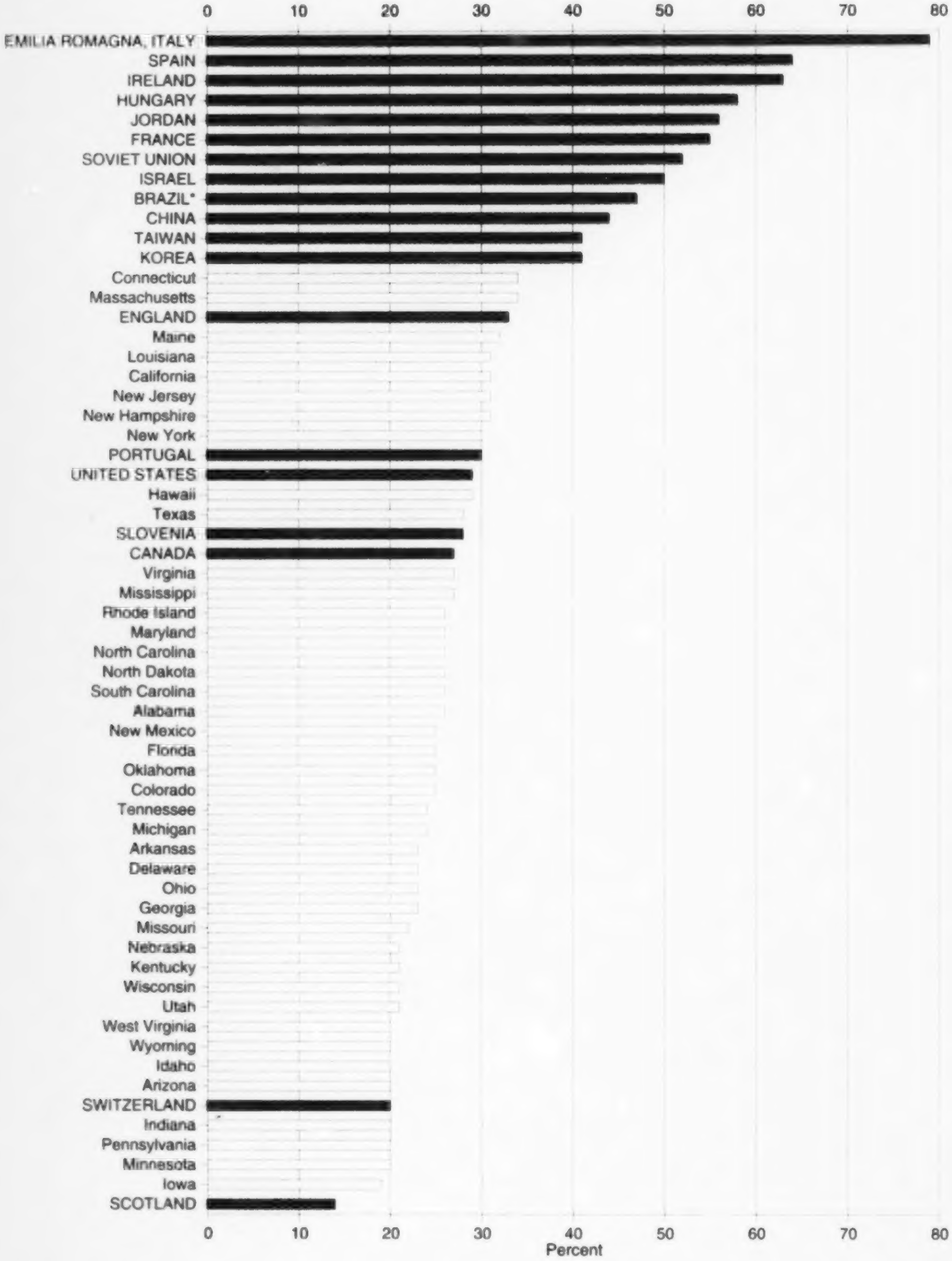

*Figure represents the unweighted average of two cities, São Paulo and Fortaleza.

NOTE: Data for the states of Alaska, Illinois, Kansas, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington are not available because they did not participate in the survey.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States,* Table 13.4. Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics,* Figure 4.3.

Figure 18b: **Percentage of 13-year-old students (in countries) and public school 8th-graders (in states) who report watching television 2 hours or more daily, by country (1991) and state (1992)**

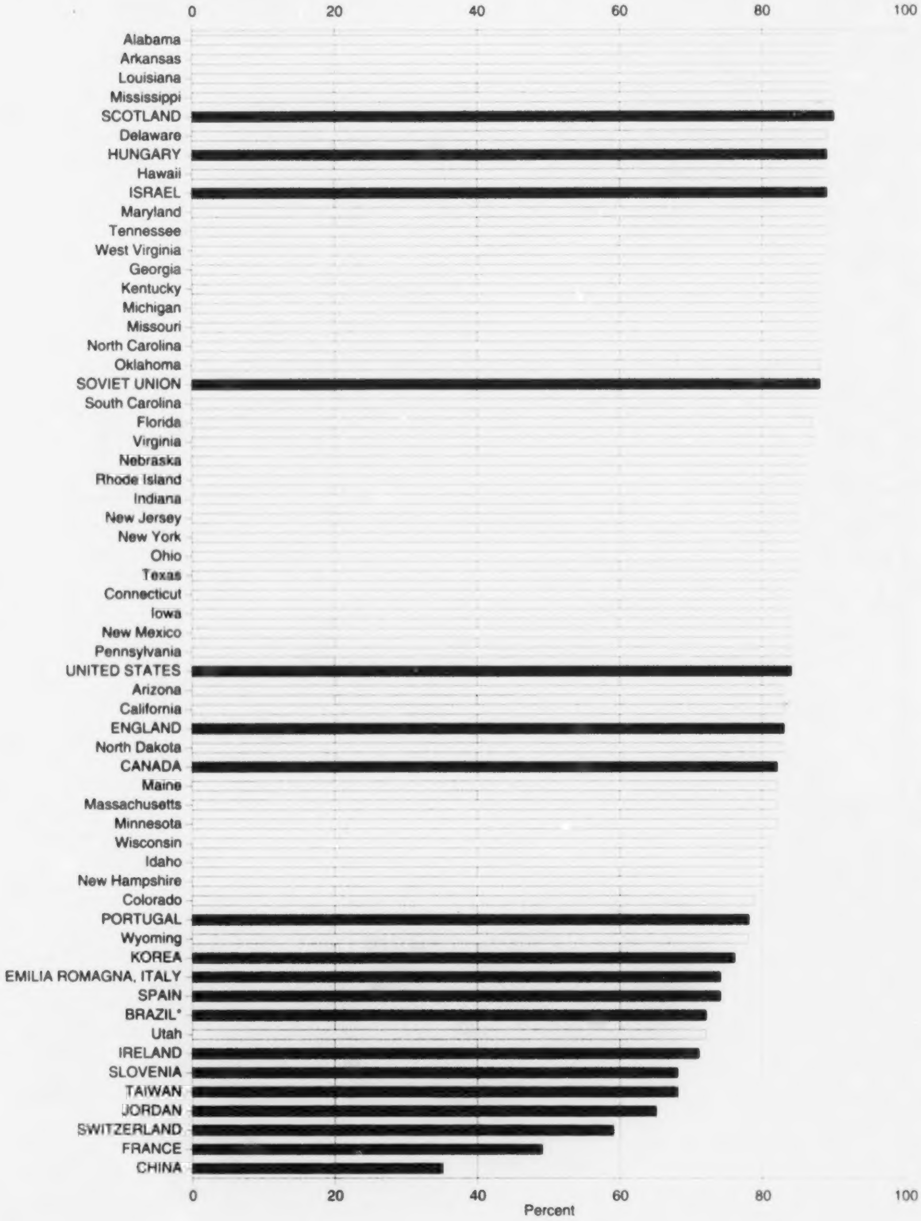

*Figure represents the unweighted average of two cities, São Paulo and Fortaleza.

NOTE: Data for the states of Alaska, Illinois, Kansas, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington are not available because they did not participate in the survey.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States*, Table 13.14. Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, Figure 4.3.

Table 18a: Percentage of 13-year-old students who report spending 2 hours or more on homework daily and watching 2 hours or more of television daily, by country: 1991

Country	Percent of students who do 2 hours or more of homework daily	Percent of students who watch TV 2 hours or more daily
São Paulo and Fortaleza, Brazil	47	72
Canada	27	82
China	44	35
England	33	83
France	55	49
Hungary	58	89
Ireland	63	71
Israel	50	89
Emilia Romagna, Italy	79	74
Jordan	56	65
Korea	41	76
Portugal	30	78
Scotland	14	90
Slovenia	28	68
Soviet Union	52	88
Spain	64	74
Switzerland	20	59
Taiwan	41	68
United States	29	84

NOTE: See supplemental note to Indicator 18 on pp. 272–278 for details on data and sample sizes from Canada, Emilia Romagna (Italy), England, Israel, Portugal, Scotland, the Soviet Union, Spain, Switzerland, and the United States; and for discussions of student time spent doing homework and watching television, the International Assessment of Educational Progress (IAEP), the National Assessment of Educational Progress (NAEP), and comparing the IAEP and the NAEP.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, Figure 4.3.

Table 18b: Percentage of public school 8th-graders who report spending 2 hours or more on homework daily and watching 2 hours or more of television daily, by state: 1992

State	Percent of students who do 2 hours or more of homework daily	Percent of students who watch TV 2 hours or more daily
Alabama	26	90
Arizona	20	83
Arkansas	23	90
California	31	83
Colorado	25	79
Connecticut	34	84
Delaware	23	89
District of Columbia	32	93
Florida	25	87
Georgia	23	88
Hawaii	29	89
Idaho	20	80
Indiana	20	85
Iowa	19	84
Kentucky	21	88
Louisiana	31	90
Maine	32	82
Maryland	26	89
Massachusetts	34	82
Michigan	24	88
Minnesota	20	82
Mississippi	27	90
Missouri	22	88
Nebraska	21	86
New Hampshire	31	80
New Jersey	31	85
New Mexico	25	84
New York	30	85
North Carolina	26	88
North Dakota	26	83
Ohio	23	85
Oklahoma	25	88
Pennsylvania	20	84
Rhode Island	26	86
South Carolina	26	88
Tennessee	24	89
Texas	28	85
Utah	21	72
Virginia	27	87
West Virginia	20	89
Wisconsin	21	81
Wyoming	20	78

NOTE: The states of Alaska, Illinois, Kansas, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington did not participate in the 1992 NAEP Trial State Assessment, the source for these data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States,* Tables 13.4 and 13.14.

Indicator 19: Instructional strategies in mathematics courses

In addition to differing beliefs about "what works" best, the instructional practices employed by teachers can be influenced by cultural, social, demographic, and financial circumstances. Here we are able to present three roughly comparable measures — the percentage of school administrators who report assigning students to mathematics classes based on ability, the percentage of students reporting that they work in small groups in math class at least once per week, and the percentage of students reporting that they take a math test or quiz at least weekly. Student data for the second and third measures are based on responses by 13-year-olds in other countries and public school 8th-graders in the United States.

- **In 1992, the percentage of lower secondary school administrators reporting the use of ability grouping in math classes in the United States was higher than that in two-thirds of the other countries reporting data for 1991. The 56 percent for the United States, however, fell 36 percentage points below the 92 percent for England, the country with the highest percentage for this measure.**

- **The United States' proportion of lower secondary students reporting that they solved problems in groups in math class at least weekly (49 percent) was mid-range among the 19 other countries represented here.**

- **Of all the countries included here, only Taiwan had a higher percentage of lower secondary students than the United States reporting that they took a math test or quiz at least once a week. The rate for Scotland and Hungary, the nations with the smallest percentage, was about one-fourth that of the United States.**

- **In general, lower secondary students in the U.S. states were more likely to report taking a math test at least once a week than were their counterparts in the other countries included. The percentage was lower in 10 of 18 other countries than in the state with the lowest percentage. Louisiana was the only nation or state where the percentage was greater than 90.**

Note on interpretation:

To a great extent, assigning students to classes based on ability is only possible in larger schools, and the greater prevalence of ability grouping in the United States may be due, at least in part, to its larger average school sizes. Smaller schools can find it difficult simply to mass enough students to form grade levels, much less ability groups within grade levels. Many other countries, moreover, offer parents and students more choice in the school they can attend, thus giving them the opportunity to "ability group" themselves by school. The differentiation that occurs in many other countries among academic, vocational, and other tracks starting at the lower secondary level might be considered yet another form of ability grouping, again, between schools rather than within schools.

Figure 19: Percentage of 13-year-old students (in other countries) and public school 8th-graders (in the U.S.) reporting that they take a math test at least once per week, by country (1991) and state (1992)

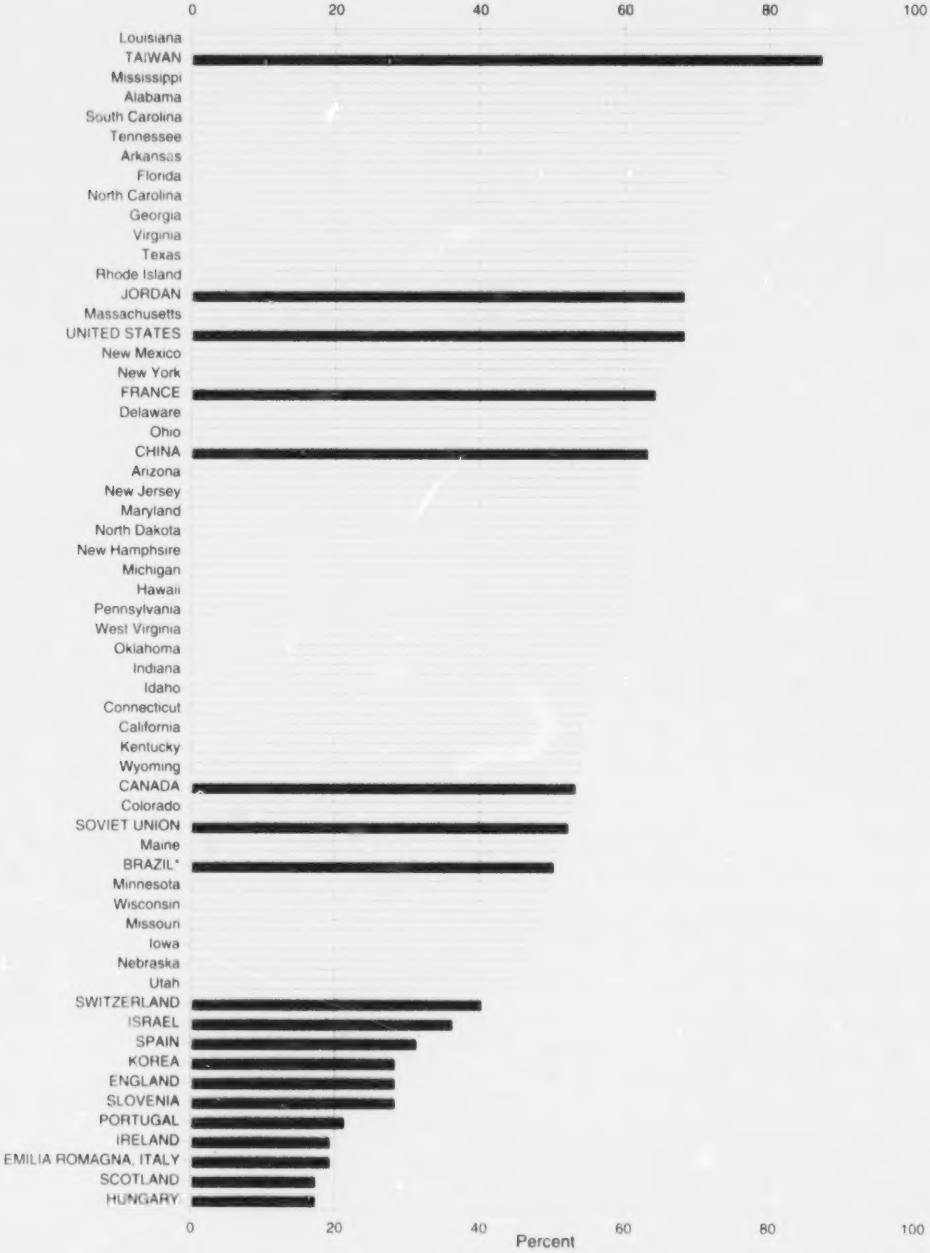

*Figure represents the unweighted average of two cities, São Paulo and Fortaleza.

NOTE: Data for the states of Alaska, Illinois, Kansas, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington are not available because they did not participate in the survey.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States,* Table 9.33. Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics,* Figure 3.1.

Table 19a: Percentage of schools where 13-year-old students are assigned to math classes based on ability, percentage of 13-year-old students who do group problem-solving in math class at least once a week, and percentage of 13-year-old students who take a math test or quiz at least once a week, by country: 1991

Country	Percent of schools where math classes are based on ability	Percent of students who do group problem-solving at least once per week	Percent of students who take math test at least once per week
São Paulo and Fortaleza, Brazil	30	65	50
Canada	10	40	53
China	3	68	63
England	92	44	28
France	27	31	64
Hungary	0	55	17
Ireland	67	42	19
Israel	74	48	36
Emilia Romagna, Italy	17	78	19
Jordan	5	83	68
Korea	0	28	28
Portugal	6	51	21
Scotland	16	27	17
Soviet Union	18	54	52
Slovenia	2	43	28
Spain	3	63	31
Switzerland	18	47	40
Taiwan	63	38	87
United States	56	49	68

NOTE: Differences exist in the samples of students questioned that may account for a difference in results between the United States' averages on the two questionnaire administrations, the IAEP and the NAEP. See supplemental note to Indicator 19 on pp. 272-278 for details on data and sample sizes from Canada, Emilia Romagna (Italy), England, Israel, Portugal, Scotland, the Soviet Union, Spain, Switzerland, and the United States; for discussions of the frequency of ability grouping, working in small groups, and classroom testing; the International Assessment of Educational Progress (IAEP); the National Assessment of Educational Progress (NAEP); and comparing questionnaire results of the IAEP and the NAEP.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, Figures 3.1 and 3.5.

Table 19b: Percentage of public school 8th-graders assigned to math classes based on ability (according to teachers), percentage of public school 8th-graders who report working in small groups on math problems, and percentage of public school 8th-graders who report taking a math test at least once a week, by state: 1992

State	Percent of students in schools where math classes are based on ability	Percent of students who work in small groups at least once per week	Percent of students who take math test at least once per week
Alabama	49	32	84
Arizona	57	37	62
Arkansas	57	32	74
California	61	43	54
Colorado	57	41	53
Connecticut	75	32	55
Delaware	84	39	64
District of Columbia	42	53	71
Florida	69	35	74
Georgia	74	35	71
Hawaii	81	40	60
Idaho	67	44	55
Indiana	63	29	56
Iowa	48	32	47
Kentucky	61	38	54
Louisiana	43	35	92
Maine	50	40	51
Maryland	84	37	62
Massachusetts	81	31	68
Michigan	58	40	60
Minnesota	52	40	50
Mississippi	44	27	87
Missouri	56	31	49
Nebraska	51	37	47
New Hampshire	57	39	60
New Jersey	72	36	62
New Mexico	65	37	66
New York	67	29	65
North Carolina	70	38	72
North Dakota	25	32	61
Ohio	55	31	63
Oklahoma	55	27	58
Pennsylvania	69	32	60
Rhode Island	75	33	69
South Carolina	80	37	79
Tennessee	56	31	76
Texas	50	38	70
Utah	81	36	46
Virginia	66	35	71
West Virginia	64	31	59
Wisconsin	44	38	49
Wyoming	61	47	54

NOTES: Data for the states of Alaska, Illinois, Kansas, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington are not available because they did not participate in the survey. Differences exist in the wording of the question regarding group problem solving that may account for difference in results between the United States' averages on the two questionnaire administrations, the IAEP and the NAEP. See technical note for Indicator 19 on p. 294 for an explanation of the difficulties inherent in comparing results between the two administrations.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States,* Tables 9.4, 9.16, and 9.33.

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Indicator 20: Time in formal instruction

Time spent in instruction can have a major influence on student achievement, since it reflects the access students have to learning opportunities. It is important to keep in mind, however, that the *quality as well as the quantity* of classroom instruction determines the educational worth of the time students spent in formal instruction. Time in formal instruction is measured here by the average hours of instruction per day, the average days of instruction per year, and the average hours of instruction per year at schools with an 8th grade in the United States and at lower secondary schools in other countries. Formal instruction is that interaction that takes place, generally in a classroom, between a teacher and a set group of students on a regularly scheduled basis.

- **Compared to other countries, U.S. schools had a relatively low number of instructional days (178) but a relatively high number of hours of instruction in each day (5.6). For the combination of both factors — the average hours of instruction per year (1,003) — U.S. schools exceeded most of the other countries represented here.**

- **In the average number of hours spent per year on formal instruction, the range across countries extended wider than that across the states. Those ranges were defined by Hungary (658 hours per year) and China (1,276 hours per year) for the countries, and by Idaho and Massachusetts (936 hours per year) and Mississippi (1,092 hours per year).**

- **In general, there were more hours of formal instruction per day in the U.S. states than in the other countries included here. More than half the countries had an average of less than 5 hours per day of formal instruction, but all states averaged more. Texas and France had the most hours per day of formal instruction, with an average of 6.2 hours.**

- **For the most part, the U.S. states in 1990-1991 had shorter school years than did the other countries for which data are available. Thirteen out of 20 other countries maintained a longer academic year than any of the fifty states. The range across the countries was also much larger than that across the states. The country with the most days of formal schooling per year (China) employed 79 more days of instruction than did the country with the fewest (Portugal), while the difference between the states with the most (New York) and the fewest (Minnesota) days of instruction was only 8 days.**

Figure 20a: Average hours per day in formal instruction, by country (1991) and state (1990–91)

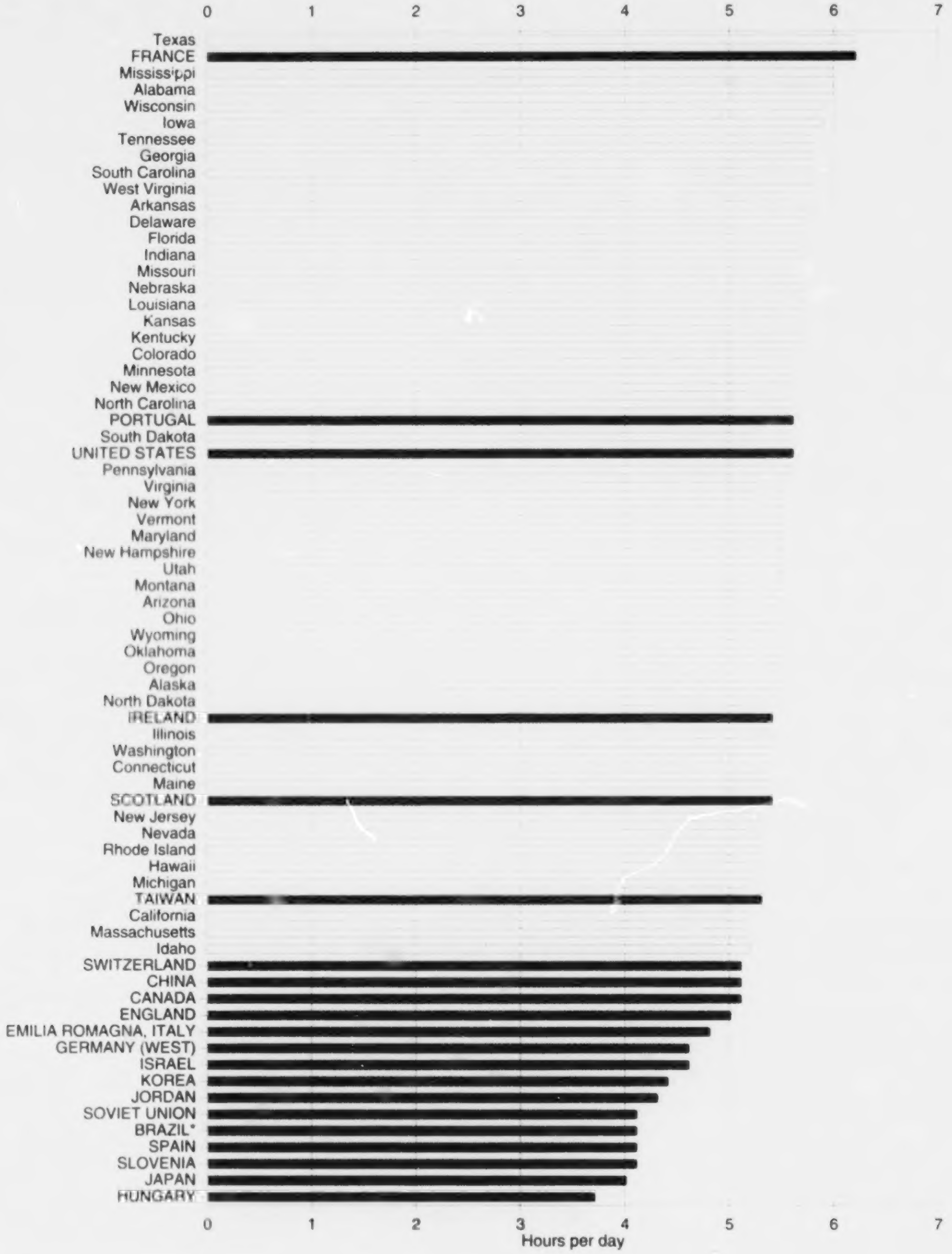

*Figure represents the unweighted average of two cities, São Paulo and Fortaleza.

SOURCE: Educational Testing Service, International Assessment of Education Progress, *Learning Mathematics*, Figure 5.2. For West Germany: International Association for the Evaluation of Educational Achievement (IEA) Study of Reading Literacy, 1992. For Japan: Ministry of Education, Science, and Culture, National Institute of Educational Research, Government of Japan, 1992. U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1990–91 (based on Table 49-3 in the *Condition of Education, 1993*).

Figure 20b: Number of days per year spent in formal instruction, by country (1991) and state (1990–91)

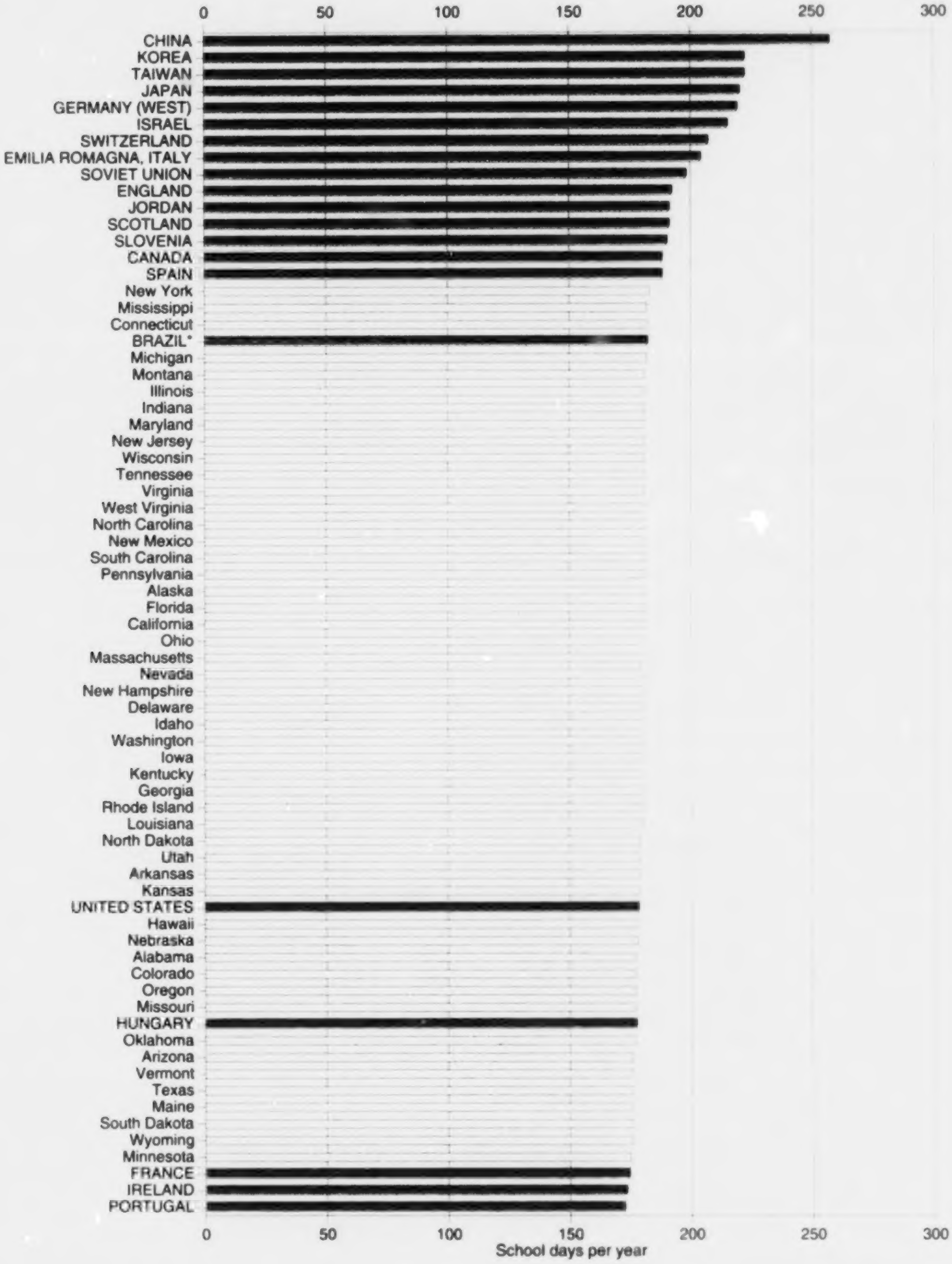

*Figure represents the unweighted average of two cities, São Paulo and Fortaleza.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1990–91 (based on Table 49-3 in the *Condition of Education, 1993*). Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, Figure 5.2

Figure 20c: Number of hours per year spent in formal instruction, by country (1991) and state (1990–91)

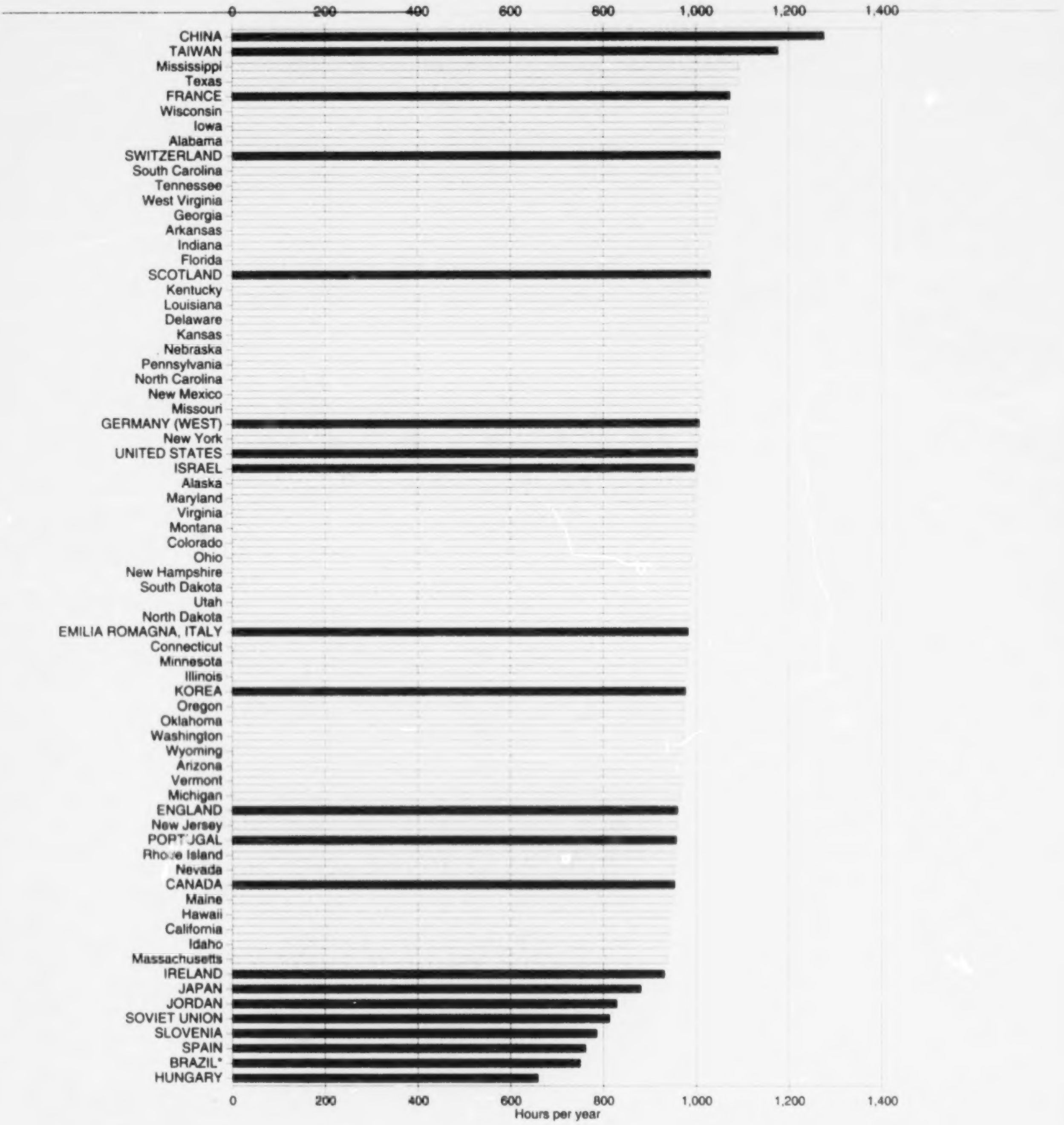

*Figure represents the unweighted average of two cities, São Paulo and Fortaleza.

SOURCE: Educational Testing Service, International Assessment of Education Progress, *Learning Mathematics*, Figure 5.2. For West Germany: International Association for the Evaluation of Educational Achievement (IEA) Study of Reading Literacy, 1992. For Japan: Ministry of Education, Science, and Culture, National Institute of Educational Research, Government of Japan, 1992. U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1990–91 (based on Table 49-3 in the *Condition of Education, 1993*).

Table 20a: Time in formal instruction in lower secondary schools measured per school day and per year, by measure and country: School year 1990-91

Country	Average minutes of instruction per school day	Average hours of instruction per day	Days of instruction per year	Average hours of instruction per year
São Paulo and Fortaleza, Brazil	247	4.1	182	749
Canada	304	5.1	188	953
China	305	5.1	251	1,276
England	300	5.0	192	960
France	370	6.2	174	1,073
Germany (West)	276	4.6	219	1,007
Hungary	223	3.7	177	658
Ireland	323	5.4	173	931
Israel	278	4.6	215	996
Emilia Romagna, Italy	289	4.8	204	983
Japan	240	4.0	220	880
Jordan	260	4.3	191	828
Korea	264	4.4	222	977
Portugal	334	5.6	172	957
Scotland	324	5.4	191	1,031
Slovenia	248	4.1	190	785
Soviet Union	258	4.1	198	812
Spain	243	4.1	188	761
Switzerland	305	5.1	207	1,052
Taiwan	318	5.3	222	1,177
United States	338	5.6	178	1,003

NOTE: See supplemental note to Indicator 20 on pp. 272-279 for details on data and sample sizes from Canada, Emilia Romagna (Italy), England, Israel, Portugal, Scotland, the Soviet Union, Spain, Switzerland, and the United States; and for discussions of the calculation of instructional hours per day for the U.S. states and the International Assessment of Educational Progress (IAEP).

SOURCE: Educational Testing Service, International Assessment of Education Progress, ***Learning Mathematics***, Figure 5.2. For West Germany: International Association for the Evaluation of Educational Achievement (IEA) Study of Reading Literacy, 1992. For Japan: Ministry of Education, Science, and Culture, National Institute of Educational Research, Government of Japan, 1992.

Table 20b: Time in formal instruction in public schools with 8th grades measured per school day and per year, by state: School year 1990–91

State	Average minutes of instruction per school day	Average hours of instruction per day	Days of instruction per year	Average hours of instruction per year
Alabama	360	6.0	177	1,062
Alaska	330	5.5	181	996
Arizona	330	5.5	176	968
Arkansas	348	5.8	179	1,038
California	312	5.2	181	941
Colorado	336	5.6	177	991
Connecticut	324	5.4	182	983
Delaware	342	5.7	180	1,026
District of Columbia	312	5.2	182	946
Florida	342	5.7	181	1,032
Georgia	348	5.8	180	1,044
Hawaii	318	5.3	178	943
Idaho	312	5.2	180	936
Illinois	324	5.4	181	977
Indiana	342	5.7	181	1,032
Iowa	354	5.9	180	1,062
Kansas	342	5.7	179	1,020
Kentucky	342	5.7	180	1,026
Louisiana	342	5.7	180	1,026
Maine	324	5.4	176	950
Maryland	330	5.5	181	996
Massachusetts	312	5.2	180	936
Michigan	318	5.3	182	965
Minnesota	336	5.6	175	980
Mississippi	360	6.0	182	1,092
Missouri	342	5.7	177	1,009
Montana	330	5.5	181	996
Nebraska	342	5.7	178	1,015
Nevada	318	5.3	180	954
New Hampshire	330	5.5	180	990
New Jersey	318	5.3	181	959
New Mexico	336	5.6	181	1,014
New York	330	5.5	183	1,007
North Carolina	336	5.6	181	1,014
North Dakota	330	5.5	179	985
Ohio	330	5.5	180	990
Oklahoma	330	5.5	177	974
Oregon	330	5.5	177	974
Pennsylvania	336	5.6	181	1,014
Rhode Island	318	5.3	180	954
South Carolina	348	5.8	181	1,050
South Dakota	336	5.6	176	986
Tennessee	348	5.8	181	1,050
Texas	372	6.2	176	1,091
Utah	330	5.5	179	985
Vermont	330	5.5	176	968
Virginia	330	5.5	181	996
Washington	324	5.4	180	972
West Virginia	348	5.8	181	1,050
Wisconsin	354	5.9	181	1,068
Wyoming	330	5.5	176	968

NOTE: The "average hours per day" measure has been adjusted to remove time for lunch and other non-instructional breaks. See supplemental note to Indicator 20 on pp. 272-279 for a discussion of the calculation of instructional hours per day for the U.S. states.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1990-91 (based on Table 49-3 in *The Condition of Education, 1993*).

ACHIEVEMENT AND ATTAINMENT INDICATORS

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Indicator 21: Educational attainment of the population

The percentage of the population completing secondary and higher education in the U.S. states and other industrialized countries provides an indication of the skill level of the U.S. workforce compared to its economic competitors. Completion levels reflect both the availability of education in a country and the extent to which completion of certain levels of education is typical. However, because many working-age adults completed their education years ago, the indicator is influenced by the development of education systems over time. Countries or states where education systems have undergone major expansions only in recent years will still show a large proportion of adults with lower levels of educational attainment, and one would expect to find those in younger age groups educated to higher levels than those in older age groups.

- **Among countries in 1991, the United States had the second highest percentage of individuals aged 25 to 64 who had completed at least an upper secondary education — 81 percent. Eighty-two percent of Germans between the ages of 25 and 64 completed at least that same level of education. For the other G–7 countries represented here, the proportions ranged from 28 to 76 percent.**

- **Among the six G–7 countries represented here, Germany, Canada, and the United States had the highest rates of upper secondary attainment among the younger cohort of 25- to 34-year-olds (at 88, 86, and 84 percent, respectively). The percentage for the United Kingdom was somewhat lower (at 79 percent), whereas those for France and Italy were much lower (at 66 and 43 percent, respectively).**

- **Of the G–7 countries, Canada had the highest percentage of higher education graduates (at both the non-university and university levels) in its 25- to 64-year-old population (40 percent) and the United States the next highest (30 percent). France and Italy had the lowest percentages (15 percent or lower).**

- **Among the six G–7 countries represented here, the United States had the highest rate of university graduation among 25- to 34-year-olds. The U.S. rate was double or triple the rates of France, Germany, Italy, or the United Kingdom.**

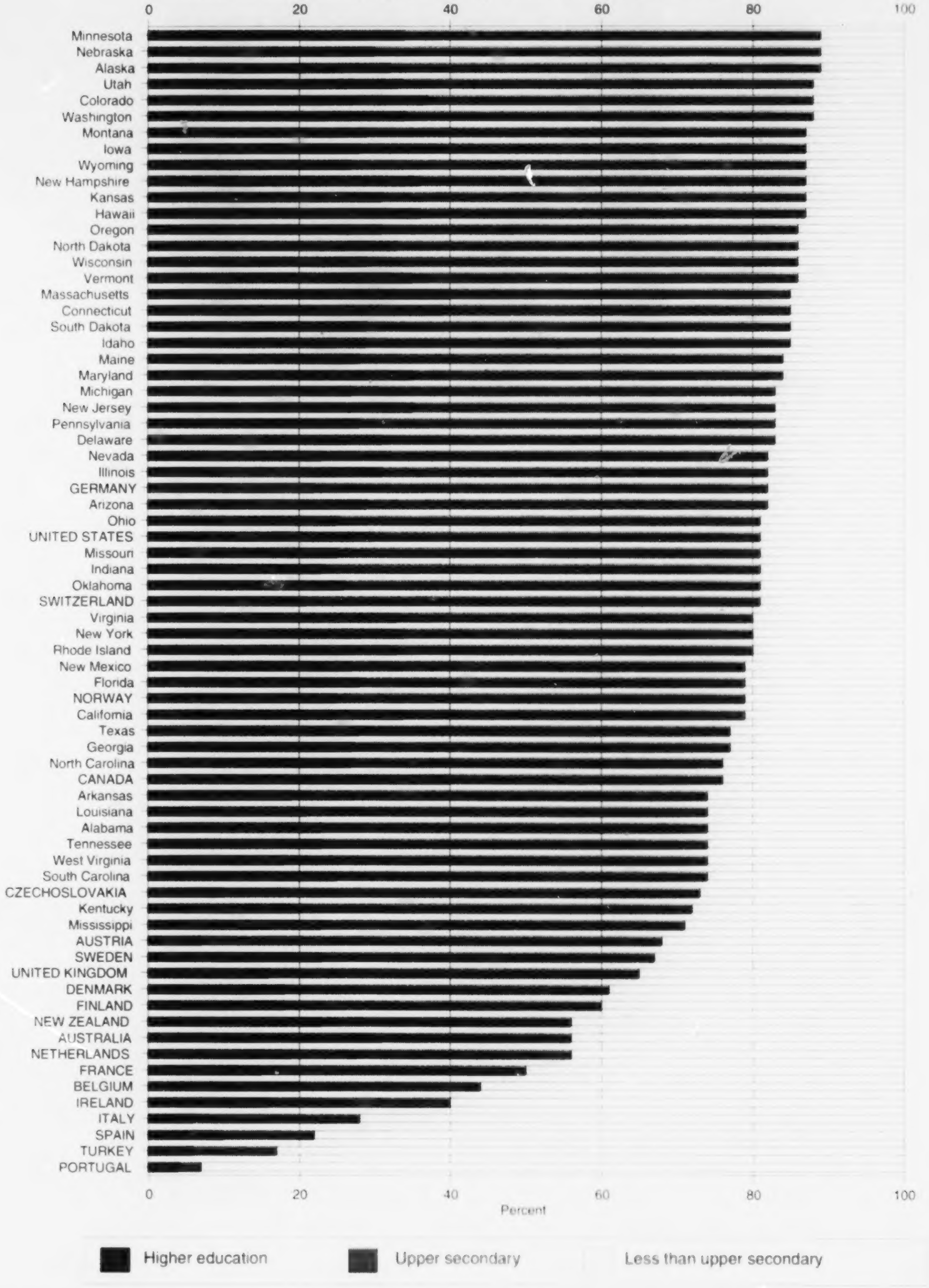
- **The states with the smallest proportions of their 25- to 64-year-old population having completed high school were Mississippi (70 percent) and Kentucky (72 percent). Those states' proportions, however, were still larger than the proportions of the population completing upper secondary degrees in 15 of the 20 other countries reported here.**

Notes on interpretation:

Although the educational attainment of a population is an indicator of the current skill level of the workforce, it is not necessarily a measure of success in educating a large proportion of the population. Within the 25- to 64-year-old age group, there may be many who have moved out of the country or state where they received their education. Thus, particularly in some U.S. states, large segments of the resident population may have been educated elsewhere.

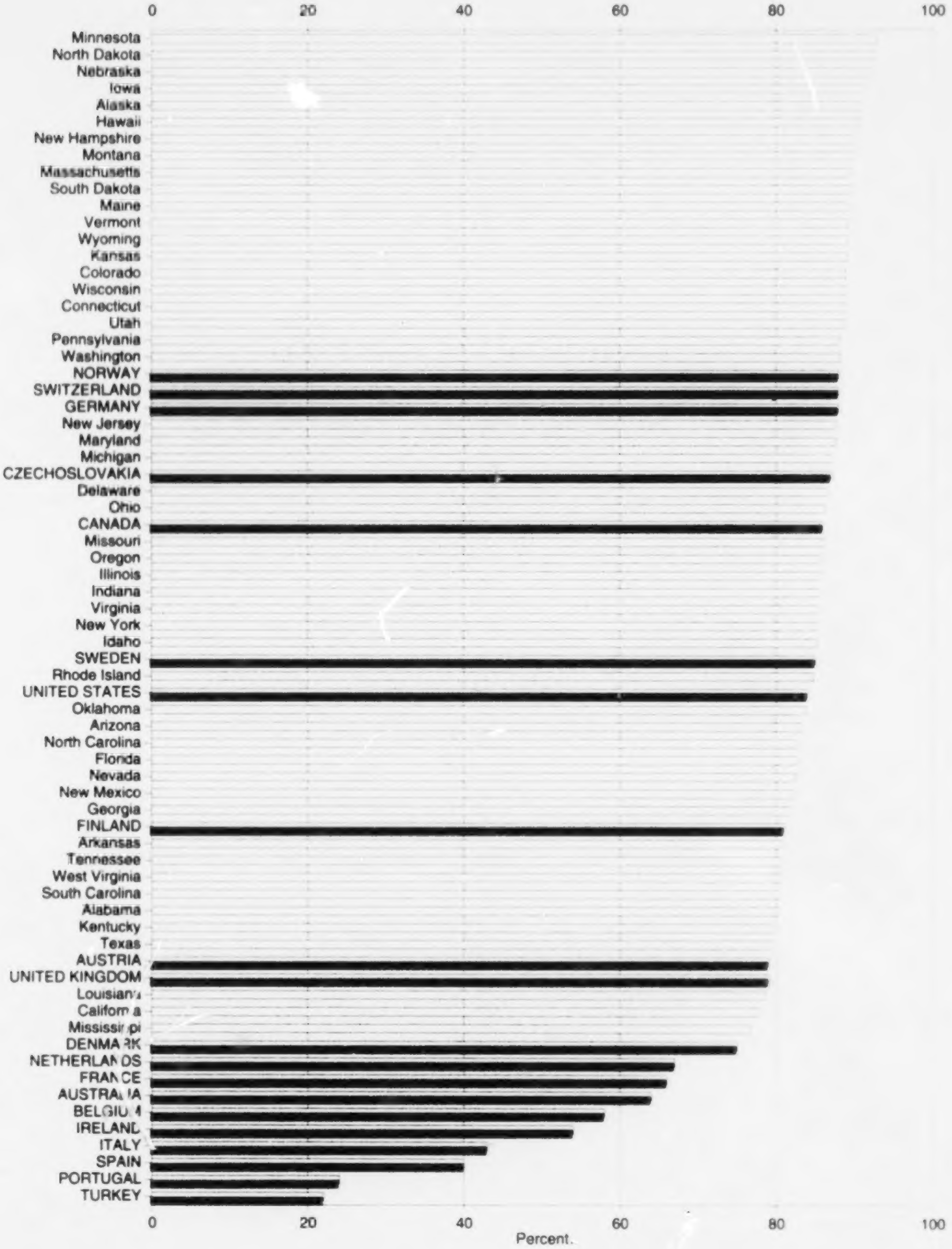
There are marked differences among countries with respect to whether certain programs are classified as belonging to the university, non-university, or upper secondary sector. For example, some programs that are begun subsequent to the completion of general secondary education are classified as non-university higher education in parts of Canada and the United States, whereas they are defined as upper secondary education in most other countries.

Figure 21a: Percentage of the population aged 25 to 64, by highest level of education attained, by country (1991) and state (1990)



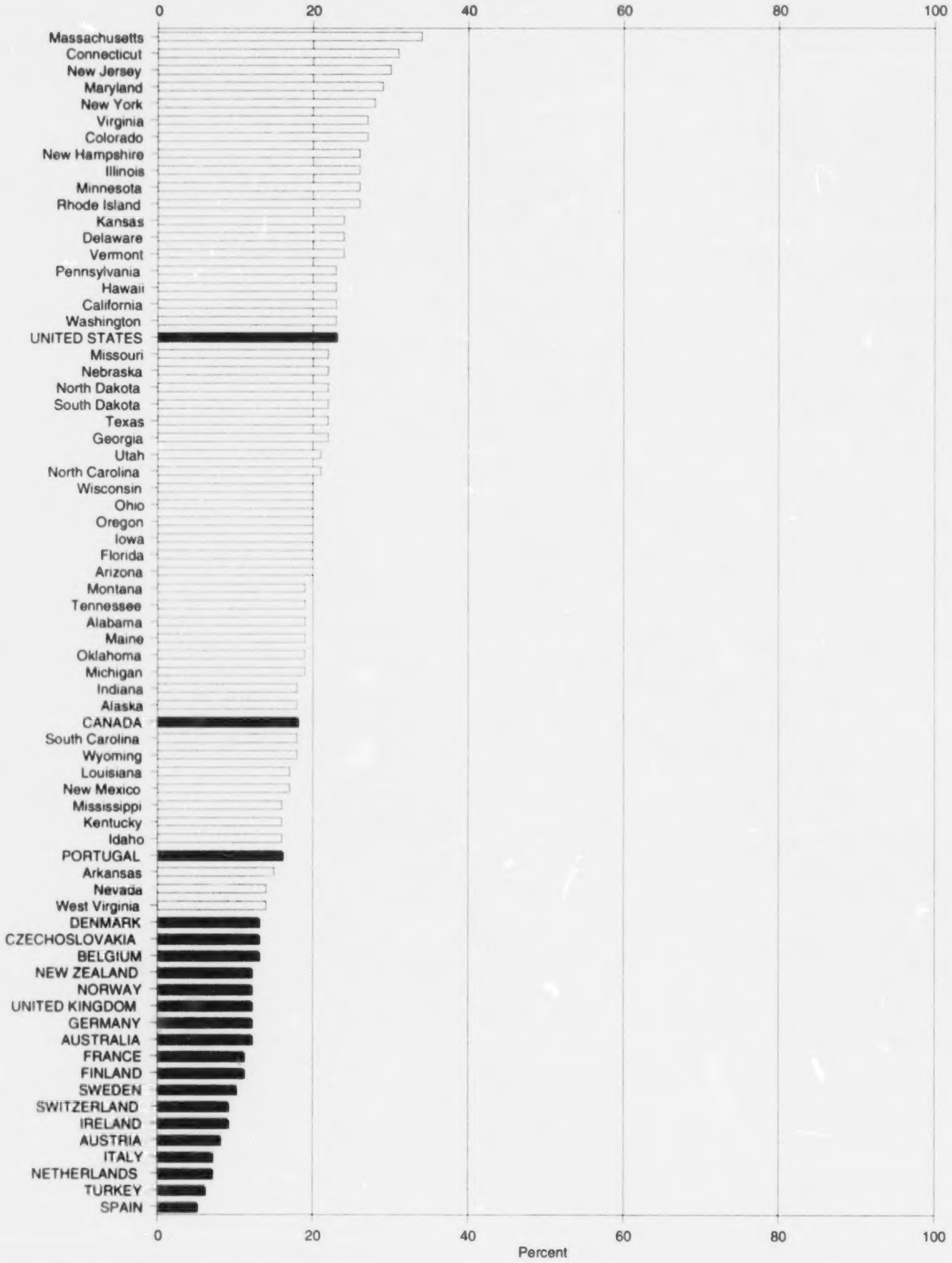
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table C1(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, *Education in the United States*, Table 1.

Figure 21b: **Percentage of the population aged 25 to 34 having attained at least an upper secondary level of education, by country (1991) and state (1990)**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table C1(B). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, *Education in the United States*, Table 1.

Figure 21c: Percentage of the population aged 25 to 34 who are university graduates, by country (1991) and state (1990)



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table S5. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, *Education in the United States*, Table 1.

Table 21a: Percentage of the population aged 25 to 64, by highest level of education attained and country: 1991

Country	Less than upper secondary	Upper secondary	Higher education (non-university)	Higher education (university)
Australia	44	25	21	10
Austria	33	61	—	7
Belgium	57	24	10	10
Canada	24	36	23	17
Czechoslovakia	27	63	—	10
Denmark	39	43	6	13
Finland	40	42	8	10
France	49	35	5	10
Germany	18	60	11	11
Ireland	60	24	8	8
Italy	72	22	—	6
Netherlands	44	37	13	6
New Zealand	44	33	13	10
Norway	21	54	12	12
Portugal	93	3	1	3
Spain	78	12	—	10
Sweden	33	44	11	12
Switzerland	19	60	13	7
Turkey	82	11	—	6
United Kingdom	35	49	7	10
United States*	19	51	7	23

— Persons are included in counts of another level of education.

*1990 data.

NOTE: Row figures may not sum to 100, due to rounding. See supplemental note to Indicator 21 on pp. 231–233 for a discussion of the levels of education; on pp. 243–248 for details on data provided by Australia, Austria, Belgium, Canada, Czechoslovakia, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States; and for a discussion comparing educational attainment data for the United States as it is found in the Current Population Survey to the same in the 1990 U.S. Census of Population.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table C1(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population, *Education in the United States*, Table 1.

Table 21b: Percentage of the population aged 25 to 64, by highest level of education attained and state: 1990

State	Less than upper secondary	Upper secondary	Higher education (non-university)	Higher education (university)
Alabama	26	51	5	18
Alaska	11	57	7	24
Arizona	18	52	7	22
Arkansas	26	55	4	15
California	21	45	9	25
Colorado	12	51	8	29
Connecticut	15	46	7	31
Delaware	17	52	8	23
District of Columbia	23	38	2	37
Florida	21	51	8	20
Georgia	23	50	6	21
Hawaii	13	52	10	25
Idaho	15	56	9	19
Illinois	18	51	7	24
Indiana	19	58	6	17
Iowa	13	59	9	20
Kansas	13	56	6	24
Kentucky	28	52	5	15
Louisiana	26	53	4	18
Maine	16	56	7	21
Maryland	16	49	6	29
Massachusetts	15	46	9	31
Michigan	17	56	8	19
Minnesota	11	55	10	25
Mississippi	29	48	6	16
Missouri	19	56	5	20
Montana	13	58	7	22
Nebraska	11	56	8	22
Nevada	18	59	7	16
New Hampshire	13	51	9	27
New Jersey	17	48	5	29
New Mexico	21	52	5	22
New York	20	46	8	26
North Carolina	24	49	8	19
North Dakota	14	53	13	21
Ohio	19	56	6	19
Oklahoma	19	55	6	20
Oregon	14	55	8	23
Pennsylvania	17	55	6	21
Rhode Island	20	47	7	25
South Carolina	26	49	7	18
South Dakota	15	56	8	20
Tennessee	26	51	4	18
Texas	23	49	6	22
Utah	12	55	9	24
Vermont	14	51	8	26
Virginia	20	47	6	27
Washington	12	54	9	25
West Virginia	26	56	4	14
Wisconsin	14	57	8	20
Wyoming	13	59	8	20

NOTE: Row figures may not sum to 100, due to rounding.

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population, *Education in the United States*, Table 1.

Table 21c: Percentage of the population having attained *at least* a certain level of education, by age group, level of education, and country: 1991

	Aged 25 to 34		Aged 25 to 64	
Country	Upper secondary	Higher education (university)	Upper secondary	Higher education (university)
Australia	64	12	56	10
Austria	79	8	68	7
Belgium	58	13	44	10
Canada	86	18	76	17
Czechoslovakia	87	13	73	10
Denmark	75	13	61	13
Finland	81	11	60	10
France	66	11	50	10
Germany	88	12	82	11
Ireland	54	9	40	8
Italy	43	7	28	6
Netherlands	67	7	57	6
New Zealand	59	12	56	10
Norway	88	12	79	12
Portugal	24	16	7	3
Spain	40	5	22	10
Sweden	85	10	67	12
Switzerland	88	9	80	7
Turkey	22	6	17	6
United Kingdom	79	12	65	10
United States*	84	23	81	23

*1990 data.

NOTE: See supplemental note to Indicator 21 on pp. 231-233 for a discussion of levels of education; on pp. 243-248 for details on data provided by Australia, Austria, Belgium, Canada, Czechoslovakia, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States; and for a discussion comparing educational attainment data for the United States as it is found in the Current Population Survey to the same in the 1990 U.S. Census of Population.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table C1(B). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population, *Education in the United States,* Table 1.

Table 21d: Percentage of the population having attained *at least* a certain level of education, by age group, level of education, and state: 1990

State	Aged 25 to 34		Aged 25 to 64	
	Upper secondary	Higher education (university)	Upper secondary	Higher education (university)
Alabama	80	19	74	18
Alaska	91	18	88	24
Arizona	83	20	81	22
Arkansas	81	15	74	15
California	78	23	79	25
Colorado	89	27	88	29
Connecticut	89	31	84	31
Delaware	87	24	83	23
District of Columbia	81	39	77	37
Florida	83	20	79	20
Georgia	83	22	77	21
Hawaii	91	23	87	25
Idaho	85	16	84	19
Illinois	86	26	82	24
Indiana	86	18	81	17
Iowa	91	20	88	20
Kansas	89	24	86	24
Kentucky	80	16	72	15
Louisiana	79	17	75	18
Maine	89	19	84	21
Maryland	88	29	84	29
Massachusetts	90	34	86	31
Michigan	87	19	83	19
Minnesota	93	26	90	25
Mississippi	77	16	70	16
Missouri	86	22	81	20
Montana	90	19	87	22
Nebraska	92	22	86	22
Nevada	83	14	82	16
New Hampshire	90	26	87	27
New Jersey	88	30	82	29
New Mexico	82	17	79	22
New York	85	28	80	26
North Carolina	83	21	76	19
North Dakota	93	22	87	21
Ohio	86	20	81	19
Oklahoma	84	19	81	20
Oregon	86	20	86	23
Pennsylvania	88	23	82	21
Rhode Island	85	26	79	25
South Carolina	80	18	74	18
South Dakota	89	22	84	20
Tennessee	81	19	74	18
Texas	79	22	77	22
Utah	89	21	88	24
Vermont	89	24	85	26
Virginia	85	27	80	27
Washington	88	23	88	25
West Virginia	81	14	74	14
Wisconsin	89	20	85	20
Wyoming	89	18	87	20

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing; *Education in the United States,* Table 1.

Indicator 22: Educational equity for women

The degree of educational equity for women in a society can be measured as the proportion of persons in the population aged 25 to 64 who attained each of various levels of education and who were women. A value of 50 percent reflects proportional equality among males and females, while a value above 50 or below 50 percent indicates an over-representation or under-representation, respectively, of females at a given level of educational attainment. Since educational attainment is often a determinant of other social or economic outcomes, such as labor market participation, occupational mobility, quality of life, and a full, efficient use of a country's or state's human resources, gender differences in educational attainment may indicate a broader social inequality between males and females.

- **The proportion of women among those with less than an upper secondary degree in 1991 was 55 percent or more in 10 of the 20 other countries reported here. However, no U.S. state had a proportion that large in 1990.**

- **With the exception of non-university higher education, the United States and Canada had similar proportions of women at every level of educational attainment. When compared to their North American counterparts, the other four G-7 countries represented here had higher female proportions at the less than upper secondary level (by as much as 21 percentage points in Germany), equal or lower proportions at the upper secondary level (by as much as 9 percentage points in the United Kingdom and France), and equal or lower proportions at the university level (by as much as 10 percentage points in Germany).**

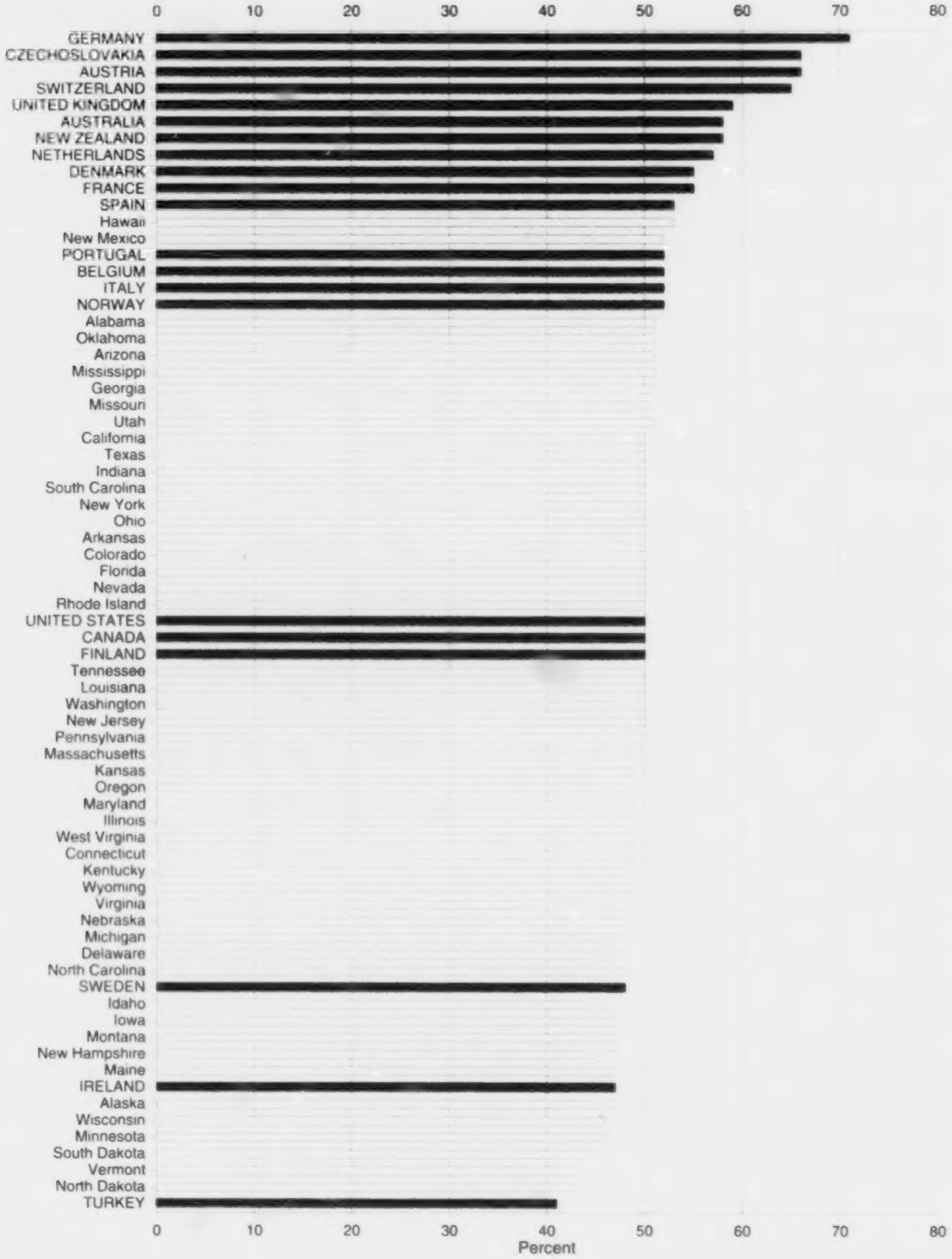
- **The proportion of women among university graduates was less than half in every country or state. In 14 of the 20 other countries represented here the female proportion of university graduates was 43 percent or less; however, only 3 of the U.S. states reported percentages that low.**

Notes on interpretation:

Although the educational attainment of a population is an indicator of the current skill level of the workforce, it is not necessarily a measure of success in educating a large proportion of the population. Within the 25- to 64-year-old age group, there may be many who have moved out of the country or state where they received their education. Thus, particularly in some U.S. states, large segments of the resident population may have been educated elsewhere.

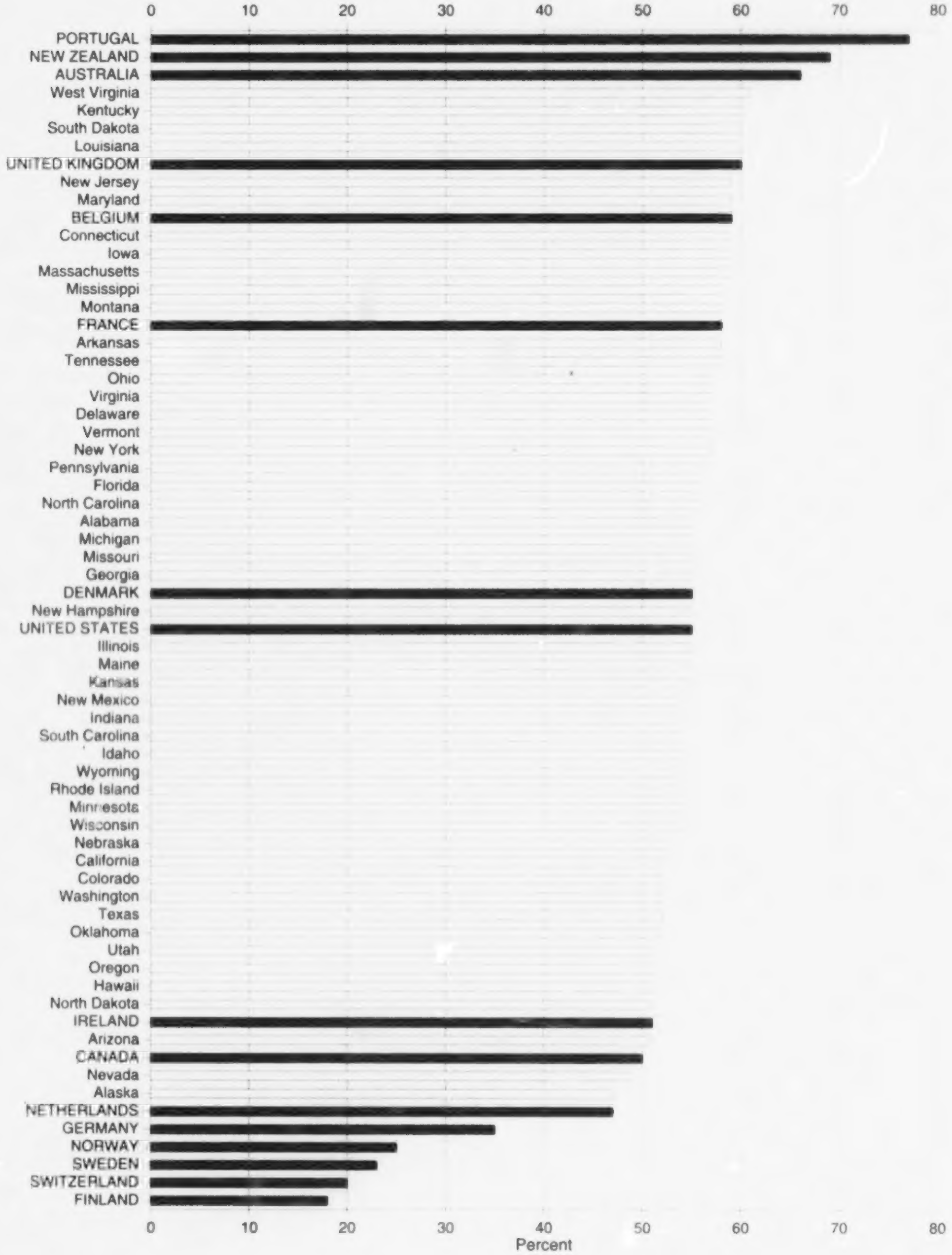
There are marked differences among countries with respect to whether certain programs are classified as belonging to the university, non-university, or upper secondary sector. For example, in some countries, programs leading to qualifications in teaching and nursing are considered to be university programs; in others, they are non-university programs. Furthermore, some programs that are begun subsequent to the completion of general secondary education are classified as non-university higher education in parts of Canada and the United States, whereas they are defined as upper secondary education in most other countries. To the extent that enrollment in any of these programs tends to be dominated by one gender, that can distort comparisons across countries using this indicator. For example, if most nursing students are female in each of two countries, but one country classifies nursing education as a university program while the other classifies it as non-university higher education, the first country may have a higher female proportion at the university level and a lower female proportion at the non-university higher education level.

Figure 22a: **Percentage of women among those aged 25 to 64 whose highest level of educational attainment is less than upper secondary, by country (1991) and state (1990)**



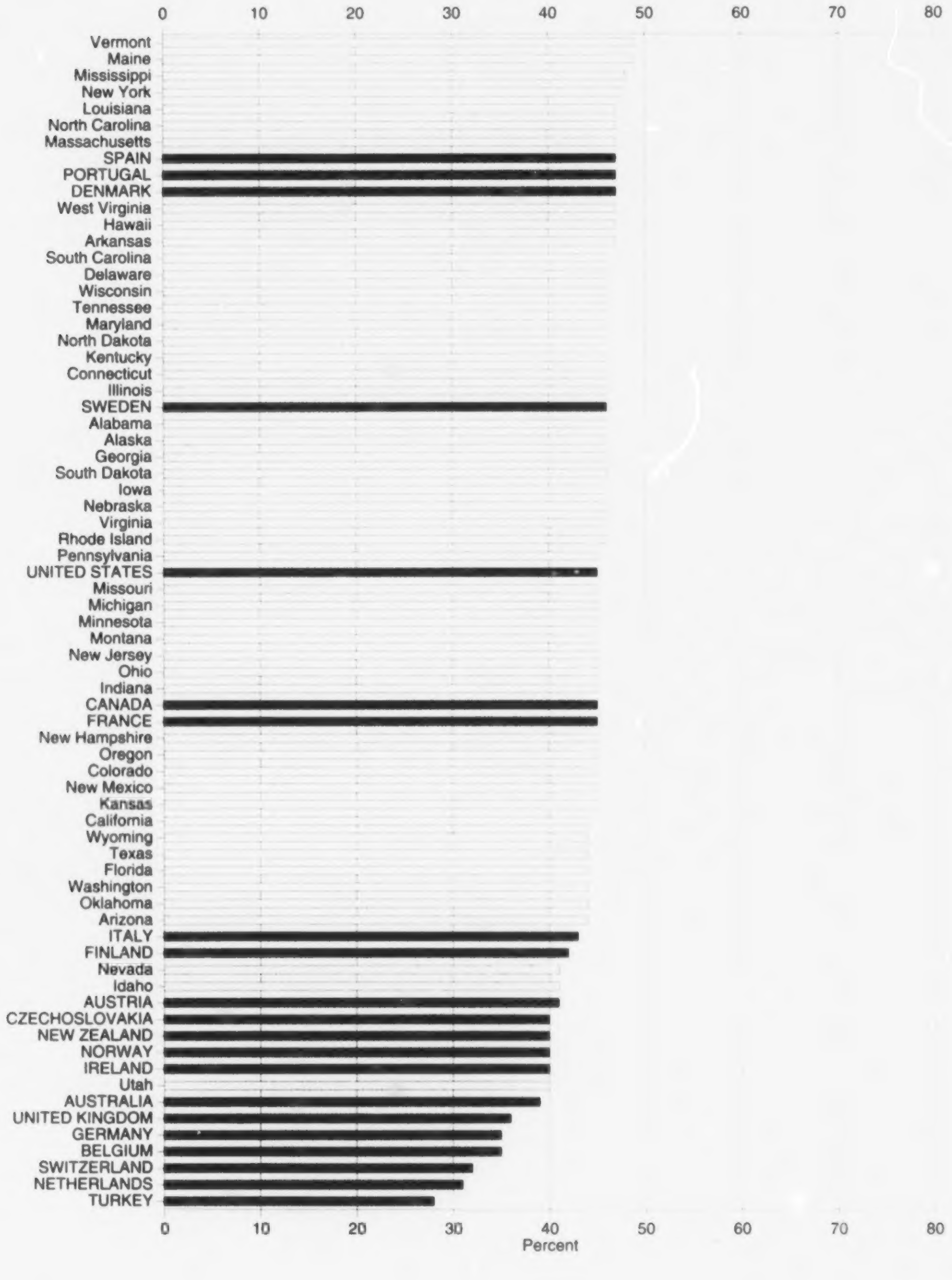
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table C2(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing; *Education in the United States*, Table 1.

Figure 22b: Percentage of women among those aged 25 to 64 whose highest level of educational attainment is non-university higher education, by country (1991) and state (1990)



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table C2(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, *Education in the United States*, Table 1.

Figure 22c: **Percentage of women among those aged 25 to 64 whose highest level of educational attainment is university education, by country (1991) and state (1990)**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table C2(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing; *Education in the United States,* Table 1.

Table 22a: Proportion of women among those aged 25 to 64, by level of educational attainment and country: 1991

Country	Less than upper secondary	Upper secondary	Higher education (non-university)	Higher education (university)	All levels
Australia	58	26	66	39	50
Austria	66	43	—	41	50
Belgium	52	47	59	35	50
Canada	50	54	50	45	51
Czechoslovakia	66	46	—	40	51
Denmark	55	45	55	47	49
Finland	50	52	18	42	50
France	55	45	58	45	51
Germany	71	49	35	35	50
Ireland	47	58	51	40	50
Italy	52	48	—	43	51
Netherlands	57	45	47	31	49
New Zealand	58	37	69	40	51
Norway	52	50	25	40	49
Portugal	52	44	77	47	52
Spain	53	43	—	47	51
Sweden	48	50	23	46	49
Switzerland	65	52	20	32	50
Turkey	41	35	—	28	40
United Kingdom	59	45	60	36	50
United States*	50	53	55	45	51

— Persons are included in counts of another level of education.

*1990 data.

NOTE: See supplemental note to Indicator 22 on pp. 231–233 for a discussion of levels of education; on pp. 243–248 for details on data provided by Australia, Austria, Belgium, Canada, Czechoslovakia, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States; and for a discussion comparing educational attainment data for the United States as it is found in the Current Population Survey to the same in the 1990 U.S. Census of Population.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table C2(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population, *Education in the United States,* Table 1.

Table 22b: Proportion of women among those aged 25 to 64, by level of educational attainment and state: 1990

State	Less than upper secondary	Upper secondary	Higher education (non-university)	Higher education (university)	All levels
Alabama	51	54	55	46	52
Alaska	47	47	47	46	47
Arizona	51	53	51	44	51
Arkansas	50	53	58	47	52
California	50	52	52	44	50
Colorado	50	53	52	45	50
Connecticut	49	54	59	46	51
Delaware	48	54	57	46	51
District of Columbia	51	55	57	50	52
Florida	50	54	56	44	51
Georgia	51	53	55	46	41
Hawaii	53	50	51	47	50
Idaho	47	53	54	41	50
Illinois	49	54	55	46	51
Indiana	50	53	54	45	51
Iowa	47	52	59	46	51
Kansas	49	52	55	45	50
Kentucky	49	53	60	46	51
Louisiana	50	54	60	47	52
Maine	47	52	55	49	51
Maryland	49	54	59	46	51
Massachusetts	50	53	59	47	51
Michigan	48	53	55	45	51
Minnesota	46	52	54	45	50
Mississippi	51	54	58	48	52
Missouri	51	53	55	45	51
Montana	47	52	58	45	50
Nebraska	48	52	53	46	51
Nevada	50	50	49	41	48
New Hampshire	47	53	55	45	50
New Jersey	50	54	59	45	51
New Mexico	52	52	54	45	51
New York	50	54	57	48	52
North Carolina	48	54	56	47	51
North Dakota	43	52	51	46	49
Ohio	50	53	57	45	52
Oklahoma	51	53	52	44	51
Oregon	49	53	51	45	50
Pennsylvania	50	54	56	45	51
Rhode Island	50	54	54	46	51
South Carolina	50	53	54	46	51
South Dakota	45	51	60	46	50
Tennessee	50	54	58	46	52
Texas	50	53	52	44	51
Utah	51	54	51	40	50
Vermont	43	52	57	49	50
Virginia	48	54	57	46	51
Washington	50	52	52	44	50
West Virginia	49	53	61	47	52
Wisconsin	46	52	54	46	50
Wyoming	49	51	54	44	50

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing; *Education in the United States,* Table 1.

Indicator 23: Secondary school completion

Upper secondary school completion is measured by the number of graduates per 100 persons in the general population of the graduation reference age, which is age 17 in the United States but which varies across countries. Countries and states with high upper secondary completion ratios may have economies that require highly skilled labor forces and that depend on the education system to provide necessary training. They also may place a higher priority on programs designed to encourage teenagers to stay in school rather than drop out. Countries and states with relatively high ratios, furthermore, may educate a large number of students from outside the typical age range enrolled in upper secondary education. This situation is common in countries where older students return for specialized vocational training, sometimes earning second or third credentials.

- **Among the G-7 countries in 1991, West Germany and Japan had the highest secondary school completion ratios, above 90 graduates per 100 persons at the graduation reference age; Italy had the lowest at about 50. The graduation ratios for France, the United Kingdom, and Canada were close to that of the United States (74).**

- **The range of secondary school graduation ratios across the U.S. states, from 63 in Florida and Louisiana to 91 in Maine, was not as broad as that across countries, which ranged from 28 in Turkey to 125 graduates per 100 persons in Finland.**

- **The secondary school completion ratio was above 85 in only four U.S. states. However, nine of the nineteen other countries recorded completion ratios that high.**

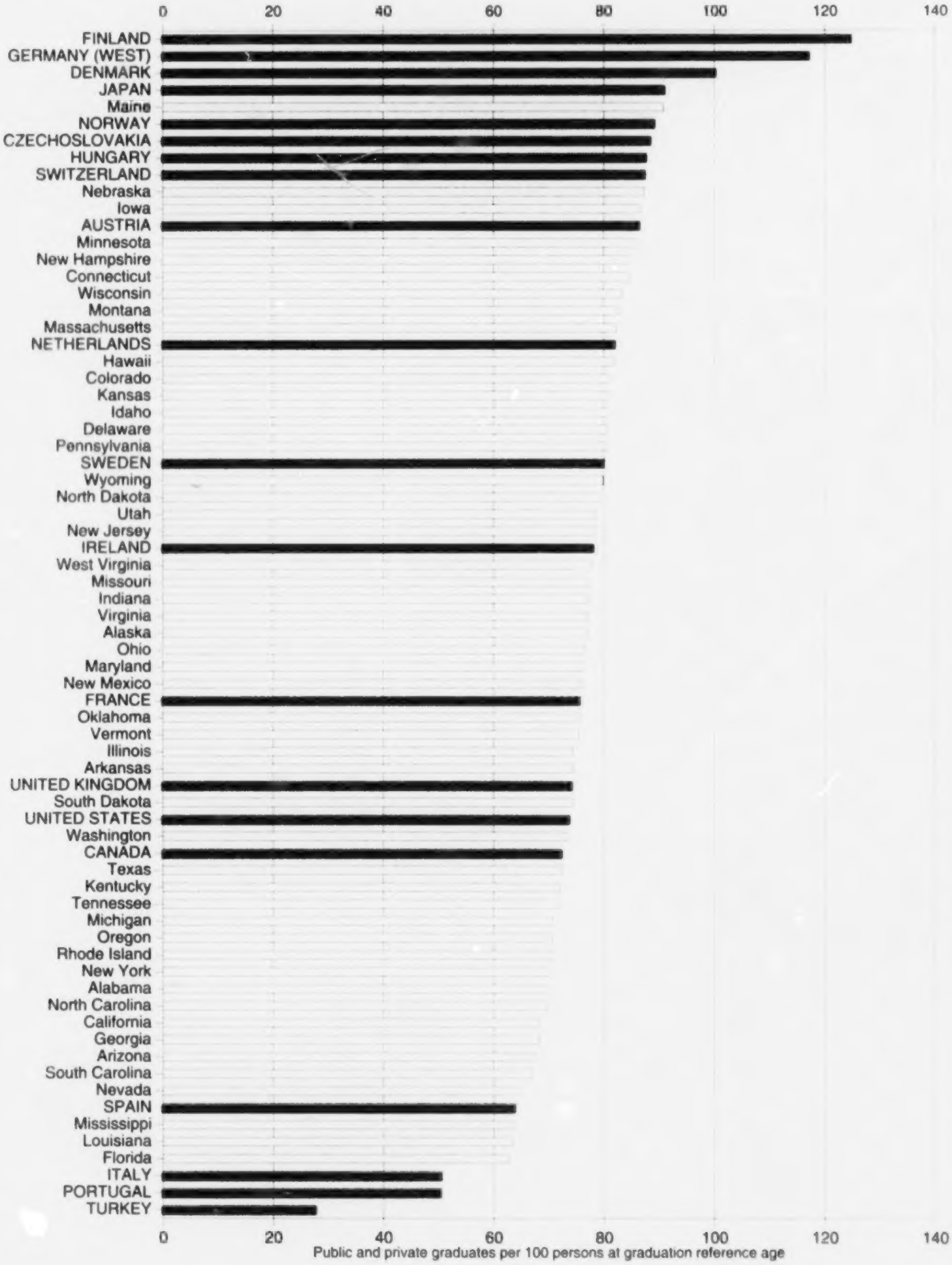
Notes on interpretation:

For the United States, upper secondary education is defined as the last three years of high school. In some countries, a large proportion of upper secondary students attend vocational, technical, or apprenticeship programs. In countries where the graduation ratio exceeds 100, it is likely that there are some students earning second degrees.

Countries differ greatly in how they classify certain programs as either higher education or upper secondary programs. For example, some programs that are begun subsequent to the completion of general secondary education are classified as non-university higher education in the United States and in parts of Canada, whereas they are defined as upper secondary education in most other countries.

A completion ratio should *not* be interpreted as a completion *rate*. Completion ratios allow comparisons across states and nations by standardizing the number of graduates at a particular education level to the size of the population in an age group typical for graduation at that level. It is not, however, an estimate of the percentage of that age group who have graduated. See supplemental note on pages 233-236 for an explanation of graduation reference age.

Figure 23: Public and private upper secondary school graduates per 100 persons at the graduation referenee age, by country and state: 1991



NOTE: In some countries, a large proportion of upper secondary students attend vocational, technical, or apprenticeship programs. In countries where the graduation ratio exceeds 100, it is likely that there are some students earning second degrees

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table R5. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, Table 99; *Digest of Education Statistics, 1994*, Table 63.

Table 23a: Public and private upper secondary graduates per 100 persons at the graduation reference age, by sex and country: 1991

Country	Graduates per 100 persons		
	Total	Male	Female
Austria	86.6	92.3	80.6
Canada	72.5	71.0	74.1
Czechoslovakia	88.6	86.9	90.4
Denmark	100.4	90.0	111.8
Finland	124.9	103.2	148.0
France	75.8	71.8	80.1
Germany (West)	117.3	118.7	115.9
Hungary	87.8	—	—
Ireland	78.3	71.0	85.9
Italy	50.7	47.3	54.4
Japan	91.1	88.0	94.3
Netherlands	82.2	87.8	76.4
New Zealand*	35.5	34.3	36.7
Norway	89.3	98.9	79.3
Portugal	50.6	43.4	58.1
Spain	64.0	58.2	70.1
Sweden	80.2	78.4	82.1
Switzerland	87.6	90.7	84.4
Turkey	27.9	33.0	22.5
United Kingdom	74.4	72.2	76.7
United States	73.9	71.7	76.2

*Graduates of general education programs only; not graduates of vocational, technical, or apprenticeship programs.

— Not available.

NOTE: In countries where the graduation ratio exceeds 100, it is likely that there are some students earning second degrees. See supplemental note to Indicator 23 on pp. 278-279 for details on data provided by Czechoslovakia, Denmark, Finland, France, West Germany, Ireland, Spain, the United Kingdom, and the United States; on pp. 231-233 for a discussion of levels of education; and on pp. 233-236 for a discussion of enrollment reference groups — typical starting ages and years of completion for upper secondary education — and for an explanation of graduation reference age.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table R5.

Table 23b: Public and private upper secondary school graduates per 100 persons 17 years old, by state: 1991

State	Graduates per 100 persons
Alabama	69.9
Alaska	77.1
Arizona	67.4
Arkansas	74.4
California	68.2
Colorado	81.2
Connecticut	84.6
Delaware	80.6
District of Columbia	69.7
Florida	62.7
Georgia	68.2
Hawaii	82.0
Idaho	80.8
Illinois	74.4
Indiana	77.3
Iowa	86.7
Kansas	81.1
Kentucky	72.1
Louisiana	63.4
Maine	90.8
Maryland	76.1
Massachusetts	82.3
Michigan	70.8
Minnesota	86.4
Mississippi	63.7
Missouri	77.5
Montana	82.7
Nebraska	87.3
Nevada	64.6
New Hampshire	84.6
New Jersey	78.5
New Mexico	76.0
New York	70.2
North Carolina	69.6
North Dakota	79.4
Ohio	76.6
Oklahoma	75.7
Oregon	70.7
Pennsylvania	80.3
Rhode Island	70.5
South Carolina	67.0
South Dakota	74.3
Tennessee	71.8
Texas	72.4
Utah	78.5
Vermont	75.5
Virginia	77.1
Washington	73.3
West Virginia	77.9
Wisconsin	83.4
Wyoming	79.9

NOTE: Data include graduates of regular day school programs, but exclude graduates of other programs and persons receiving high school equivalency certificates.

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Table 99; *Digest of Education Statistics, 1994,* Table 63.

Indicator 24: University completion

The proportion of young people completing bachelor's degrees in the United States and its equivalent in other industrialized countries provides an indication of the skill level of entrants into the U.S. workforce and those of its economic competitors. Even though some graduates migrate across states or nations after graduation, the ratio of college and university graduates to the local population at the graduation reference age (university completion ratio) is an indicator of the skill level of the young adult labor pool in a particular state or country.

- **Among the G-7 countries in 1991, only Canada had a greater university completion ratio than the United States (33 versus 30 graduates per 100 persons at the graduation reference age). The ratio for the United States was more than twice that of Germany, and more than triple that of Italy.**

- **The university completion ratio ranged from less than 8 in Austria, Hungary, Spain, Switzerland, and Turkey, to more than 25 in Canada, Norway, and the United States. Only Canada and the United States had ratios higher than 25 for both males and females.**

- **In general, most U.S. states had university completion ratios much higher than those of the countries included here in 1991. Forty-eight states had university completion ratios of 20 or higher, and 32 states had ratios of at least 30. Only four of the other countries for which data were reported had university completion ratios as high as 20, and only Norway and Canada had ratios above 30.**

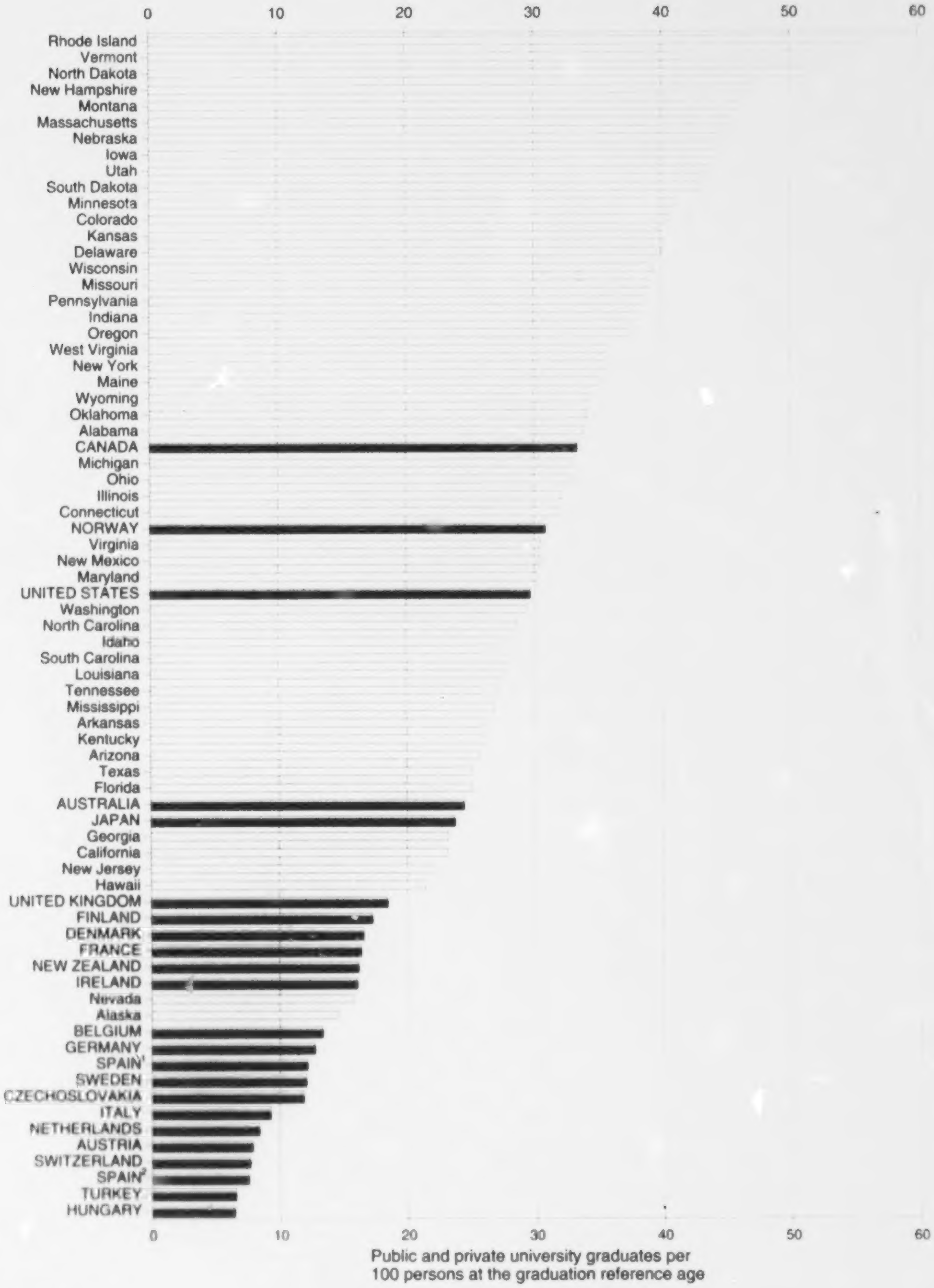
- **For half of the countries included here, and for all but one of the states, the number of graduates per 100 persons at the graduation reference age was higher among females than males. The female graduation ratio was more than 10 percentage points greater than the male ratio in 2 countries (Canada and Norway) and 6 states (Delaware, Hawaii, Maine, Rhode Island, South Dakota, and Virginia). Japan was the only country where the male graduation ratio was more than 6 percentage points higher than the female ratio, with a percentage point difference of 20.**

Notes on interpretation:

All students completing bachelor's degrees (or the equivalent) in country or state universities are included in the higher education completion figures. That includes students who had lived in other countries or states before attending their university or who moved to other countries or states after attending their university. Some states and countries, particularly those with a relatively large public university system and many private universities, may have a surplus of "in-migrant" students. Other states and countries, particularly those with a relatively small public university system and few private universities, may have a deficit of "out-migrant" students. Among OECD countries, Luxembourg is notable for a deficit of out-migrant students, as most of its university students attend universities in neighboring countries. See Indicator 11 for a migration adjustment across U.S. states, made at the initial point of that migration — when students first enter higher education institutions.

A completion ratio should *not* be interpreted as a completion *rate*. Completion ratios allow comparisons across states and nations by standardizing the number of graduates at a particular education level to the size of the population in an age group typical for graduation at that level. It is not, however, an estimate of the percentage of that age group who have graduated. See supplemental note on pages 233-236 for a discussion of graduation reference age.

Figure 24: Public and private university graduates per 100 persons at the graduation reference age, by country and state: 1991



¹Licenciado
²Diplomado

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance 1993*, Table R6. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. U.S. Department of Educatic National Center for Education Statistics, *Digest of Education Statistics, 1993*, Table 236.

Table 24a: Public and private university graduates per 100 persons at the graduation reference age and degrees, by sex and country: 1991

Country	Name of degree	Graduates per 100 persons		
		Total	Male	Female
Australia	Bachelor	24.4	21.6	27.3
Austria	Diplom	7.8	8.5	7.0
Belgium	License	13.3	15.0	11.5
Czechoslovakia	Magister	11.8	12.9	10.7
Canada	Bachelor	33.3	28.2	38.7
Denmark	Bachelor	16.5	14.4	18.7
Finland	Master	17.2	17.0	17.4
France	License	16.3	14.9	17.7
Germany	Staats-Diplomprüfung	12.7	14.8	10.4
Hungary	University diploma	6.4	—	—
Ireland	Bachelor	16.0	15.8	16.2
Italy	Laurea	9.2	9.1	9.2
Japan	Gakushi	23.7	33.5	13.7
Netherlands	Doctoraal examen	8.3	9.6	6.9
New Zealand	Undergraduate Bachelor	16.1	16.5	15.8
Norway	Master and Cand.mag	30.8	22.3	39.7
Spain	Licenciado	12.1	10.7	13.5
Spain	Diplomado	7.5	5.3	9.8
Sweden	Undergraduate Bachelor	12.0	10.4	13.6
Switzerland	License	7.6	9.8	5.4
Turkey	Lisans	6.5	8.2	4.7
United Kingdom	Bachelor	18.4	19.0	17.7
United States	Bachelor	29.6	26.7	32.6

— Not available.

NOTE: See supplemental note to Indicator 24 on p. 280 for details on data provided by Denmark, France, Germany, Ireland, Spain, the United Kingdom, and the United States; on pp. 231-233 for a discussion of levels of education; and on pp. 233-236 for a discussion of graduation reference ages and enrollment reference groups — typical starting ages and years of completion for higher education.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table R6.

Table 24b: Public and private university graduates per 100 persons 22 years old, by sex and state: 1991

State	Graduates per 100 persons		
	Total	Male	Female
Alabama	33.9	30.7	37.0
Alaska	14.5	10.4	19.5
Arizona	25.6	23.4	28.0
Arkansas	26.1	22.8	29.4
California	23.2	21.0	25.4
Colorado	40.5	38.1	43.0
Connecticut	32.0	29.0	35.1
Delaware	39.9	33.1	46.5
District of Columbia	67.9	62.2	72.8
Florida	25.1	22.9	27.3
Georgia	23.2	20.4	26.1
Hawaii	21.4	16.9	27.1
Idaho	27.9	24.8	31.6
Illinois	32.1	29.5	34.7
Indiana	38.3	36.2	40.4
Iowa	45.0	41.2	49.0
Kansas	40.0	35.9	44.5
Kentucky	26.1	22.5	29.8
Louisiana	27.5	24.0	30.8
Maine	35.2	30.2	40.3
Maryland	30.2	27.7	32.7
Massachusetts	45.6	40.8	50.3
Michigan	33.1	30.7	35.4
Minnesota	41.0	36.9	45.1
Mississippi	26.9	22.4	31.3
Missouri	39.1	36.3	41.8
Montana	46.2	45.1	47.3
Nebraska	45.4	40.8	50.0
Nevada	15.8	13.1	18.8
New Hampshire	47.3	42.9	51.7
New Jersey	22.1	19.7	24.6
New Mexico	30.5	26.8	34.3
New York	35.7	32.7	38.7
North Carolina	28.6	24.2	33.5
North Dakota	53.0	50.2	56.0
Ohio	32.9	30.3	35.5
Oklahoma	34.1	30.5	37.8
Oregon	37.3	34.9	39.7
Pennsylvania	38.7	35.6	41.7
Rhode Island	56.2	51.3	61.4
South Carolina	27.8	24.1	31.7
South Dakota	43.2	38.2	48.7
Tennessee	27.2	24.9	29.4
Texas	25.1	22.9	27.4
Utah	43.8	44.7	42.9
Vermont	54.7	50.3	59.4
Virginia	30.5	25.0	36.6
Washington	29.3	26.1	32.7
West Virginia	35.7	34.1	37.3
Wisconsin	39.3	35.2	43.3
Wyoming	34.2	32.3	36.1

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Table 236.

Indicator 25: Mathematics achievement (experimental)

Goal 5 of the National Education Goals states that by the year 2000, U.S. students will be first in the world in science and mathematics achievement. This goal is based on the belief that our nation's ability to compete globally rests upon workers having strong science and mathematics skills and on their ability to apply those skills to emerging technologies. In as few as five years from now, the youth of today will be competing in the global marketplace. They will depend on the mathematics learned in school to succeed in the complex business and technological environment of the future. This indicator compares the average and percentile scores of 13-year-old students in many countries to 8th graders from public schools in most U.S. states.

- **In 1991, U.S. 13-year-old students had lower average scores in mathematics proficiency than students of the same age group in all but 2 other countries.**

- **Average mathematics proficiency scores among 13-year-old students in the United States were 23 scale points below their Taiwanese counterparts. This was more than half of the difference between 9- and 13-year-olds in the United States (40 points),[*] suggesting that U.S students at age 13 may be performing at levels similar to Taiwanese students approximately 2 years younger.**

- **Over 25 percent of 13-year-olds in Taiwan and Korea had mathematics proficiency scores above 300 in 1991, while about 10 percent of U.S. students in the same age group scored above that level. However, in 5 U.S. states, 25 percent or more of 8th grade public school students scored above this level in 1992.**

- **There was greater variation in the mathematics proficiency scores of students within countries and states than across countries and states. For example, among 8th-grade public school students, the difference between the 10th and 90th percentile was 90 scale points in Mississippi and 96 in Taiwan, compared to a difference in average proficiency of 39 scale points between Taiwan and Mississippi.**

Notes on interpretation:

In the 1991 International Assessment of Educational Progress (IAEP), 20 countries assessed the mathematics achievement of 13-year-olds. The country-level data provided in Table 25a are the result of a study linking the 1991 IAEP scores to the 1992 National Assessment of Educational Progress (NAEP) scores. Scores were projected for IAEP participants onto the NAEP scale. The state scores presented in Table 25b for public school 8th-grade students are from the 1992 NAEP Trial State Assessment. Caution should be exercised when comparing results across countries and states, for the age distribution of 8th graders tested in the states is likely to be older than the 13-year-olds tested in IAEP. Furthermore, the results of a linking study of this type are heavily dependent on the equating method used. For these reasons, this indicator is classified as *experimental*. See the supplemental note to Indicator 25 on pages 281–291 for a discussion of these issues.

Caution should be exercised when comparing states and nations by their rank order on any given test measure. These measures are subject to some sampling error. In comparing two estimates, one must use the standard error of the difference. (See the note on standard errors of estimates from the IAEP and the NAEP on page 310 for details.) See Table 25x in the Statistical Appendix for the standard errors.

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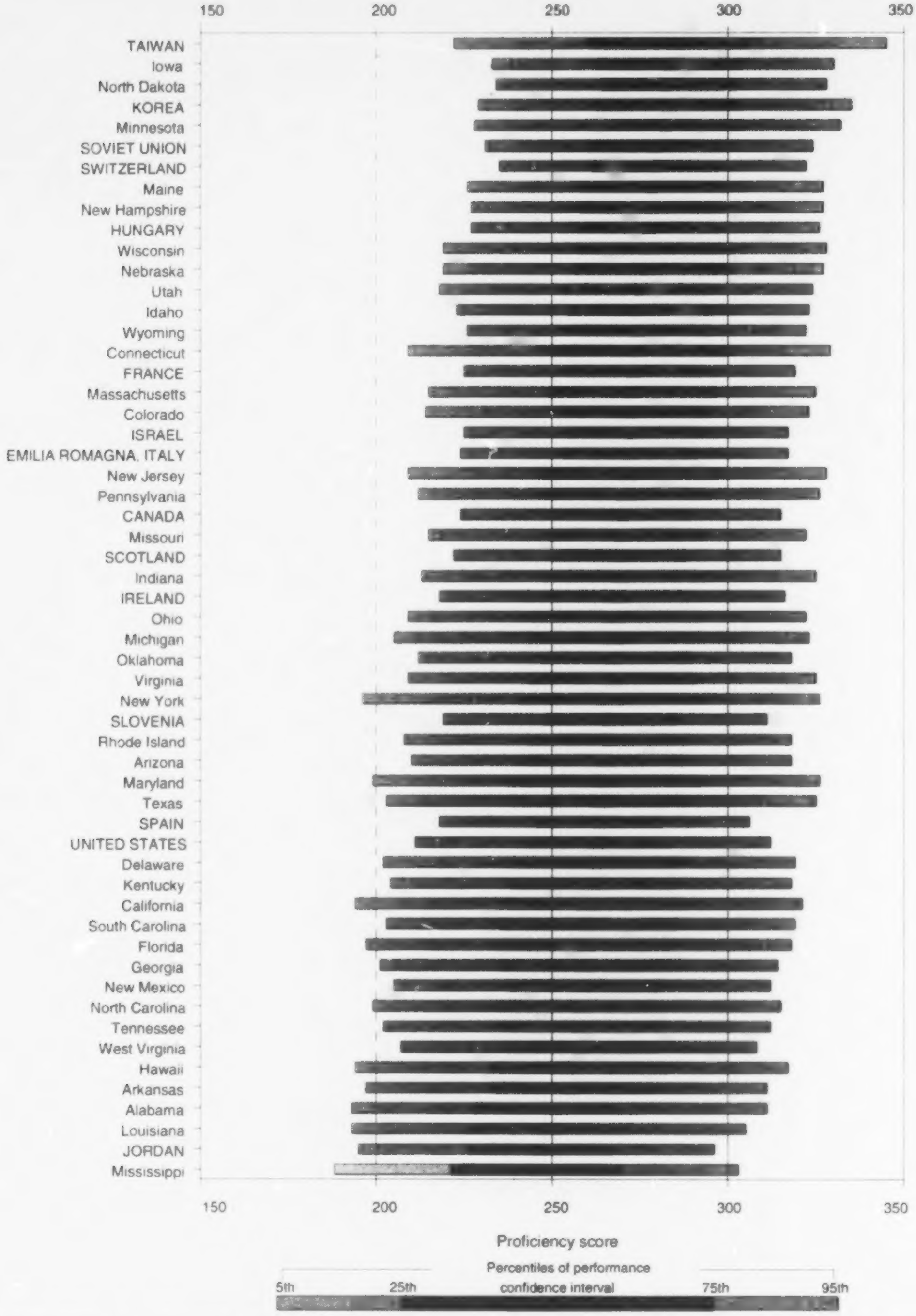
[*] U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1994*, Indicator 14.

Figure 25: Mathematics proficiency scores for 13-year-olds in countries and public school 8th-grade students in states, by country (1991) and state (1992)



NOTE: The center darkest box indicates a confidence interval around the average mathematics proficiency for the country or state calculated as the mean plus or minus two times the standard error. Test scores range from 0 to 500. The states of Alaska, Illinois, Kansas, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington did not participate in the survey. Caution should be exercised when comparing states and nations by their rank order on any given test measure. These measures are subject to some sampling error. In comparing two estimates, one must use the standard error of the difference (See the note on standard errors of estimates from the IAEP and the NAEP on page 310 for details.) See Table 25x in the Statistical Appendix for the standard errors.

SOURCE: Educational Testing Service, IAEP/NAEP Cross-linking Study, 1993; U.S. Department of Education, National Center for Education Statistics, *NAEP 1992 Mathematics Report Card for the Nation and the States*, 1993.

Table 25a: Mathematics proficiency scores for 13-year-olds, by country: 1991

Country	Average proficiency	Percentile score 5th	10th	25th	50th	75th	90th	95th
Canada	270	224	235	252	270	289	305	315
France	273	225	236	254	273	292	309	319
Hungary	277	227	239	257	278	297	315	326
Ireland	269	218	230	249	269	289	306	316
Israel	272	225	236	254	273	291	307	317
Emilia Romagna, Italy	272	224	235	253	272	291	308	317
Jordan	246	195	207	226	247	267	285	296
Korea	283	229	242	262	284	304	323	335
Scotland	269	222	233	250	270	288	305	315
Slovenia	266	219	230	247	266	285	302	311
Soviet Union	279	231	242	260	279	298	315	324
Spain	263	218	228	245	263	281	297	306
Switzerland	279	235	244	261	279	297	313	322
Taiwan	285	222	236	260	286	310	332	345
United States	262	211	223	242	263	283	301	312

NOTE: Only countries in which comprehensive student populations were represented by the test-taking sample are included. Test administrations in Brazil, China, England, and Portugal either excluded groups or had low participation rates. See supplemental note to Indicator 25 on pp. 281-291 for details on data collected from Canada, England, Israel, Italy, Portugal, Scotland, the Soviet Union, Spain, Switzerland, and the United States and for a description of the IAEP, the NAEP, their Cross Linking Study, and the measurement scale they employ.

Mathematics Proficiency Scale has a range from 0 to 500:
Level 150: Simple arithmetic facts.
Level 200: Beginning skills and understandings.
Level 250: Numerical operations and beginning problem solving.
Level 300: Moderately complex procedures and reasoning.
Level 350: Multi-step problem solving and algebra.

SOURCE: Educational Testing Service, IAEP/NAEP Cross-linking Study, 1993.

Table 25b: Mathematics proficiency scores for 8th-grade students in public schools, by state: 1992

State	Average proficiency	Percentile score 5th	10th	25th	50th	75th	90th	95th
Alabama	251	193	206	227	251	276	299	311
Arizona	265	210	222	243	265	287	307	318
Arkansas	255	197	211	233	256	279	299	311
California	260	194	209	234	261	288	309	321
Colorado	272	214	228	250	273	295	313	323
Connecticut	273	209	224	249	275	299	318	329
Delaware	262	202	216	239	262	287	307	319
District of Columbia	234	176	189	209	233	257	280	296
Florida	259	197	210	234	260	285	306	318
Georgia	259	201	214	235	259	283	303	314
Hawaii	257	194	208	231	257	283	305	317
Idaho	274	223	235	254	275	296	313	323
Indiana	269	213	225	247	270	293	313	325
Iowa	283	233	244	263	284	304	321	330
Kentucky	261	204	216	238	262	285	305	318
Louisiana	249	193	205	226	250	272	293	305
Maine	278	226	239	258	279	299	316	327
Maryland	264	199	213	237	265	292	314	326
Massachusetts	272	215	229	249	273	297	316	325
Michigan	267	205	220	243	268	292	311	323
Minnesota	282	228	240	260	283	304	322	332
Mississippi	246	188	201	221	245	270	291	303
Missouri	270	215	228	249	272	293	312	322
Nebraska	277	219	234	256	279	300	317	327
New Hampshire	278	227	238	258	278	299	316	327
New Jersey	271	209	222	247	273	297	317	328
New Mexico	259	205	217	237	259	281	300	312
New York	266	196	213	241	268	293	314	326
North Carolina	258	199	212	234	258	282	303	315
North Dakota	283	234	245	264	284	302	318	328
Ohio	267	209	222	244	269	292	310	322
Oklahoma	267	212	226	247	268	290	308	318
Pennsylvania	271	212	225	248	272	295	314	326
Rhode Island	265	208	221	243	267	289	307	318
South Carolina	260	203	215	235	259	285	307	319
Tennessee	258	202	214	235	258	282	302	312
Texas	264	203	216	238	264	289	312	325
Utah	274	218	232	253	275	296	314	324
Virginia	267	209	221	243	267	291	313	325
West Virginia	258	207	218	237	258	280	298	308
Wisconsin	277	219	233	257	279	301	318	328
Wyoming	274	226	236	254	275	295	312	322

NOTE: The states of Alaska, Illinois, Kansas, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington did not participate in survey.

Mathematics Proficiency Scale has a range from 0 to 500:
Level 150: Simple arithmetic facts.
Level 200: Beginning skills and understandings.
Level 250: Numerical operations and beginning problem solving.
Level 300: Moderately complex procedures and reasoning.
Level 350: Multi-step problem solving and algebra.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *NAEP 1992 Mathematics Report Card for the Nation and States*, 1993.

LABOR MARKET OUTCOMES INDICATORS

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Indicator 26: Unemployment and education

The unemployment rate measures the percentage of the labor force aged 25 to 64 who are unable to find employment. If unemployment rates decrease as the level of educational attainment increases, higher levels of education could be considered worthwhile investments. In some economies, however, this kind of positive relationship between educational attainment and employment may not be as strong as in others, or it may not exist at all. Not all countries or states need their workforce to hold the same academic credentials. Moreover, even people with high levels of education and training may not fare well in the job market if there is not a current demand for their particular skills.

- **In most countries in 1991, lower unemployment rates were associated with higher levels of educational attainment. In the United States, the unemployment rate for people who did not complete high school was 5.3 percentage points higher than that for those who completed high school. A large difference in unemployment rates between those two education levels (less than upper secondary and upper secondary) also existed in Canada (4.6 percentage points), but was not quite as large in France, Germany, or the United Kingdom (about 4 percentage points each). In Italy, there was a slight difference in the opposite direction, with unemployment 1.5 percentage points higher for the upper secondary graduates than for those with less than upper secondary credentials.**

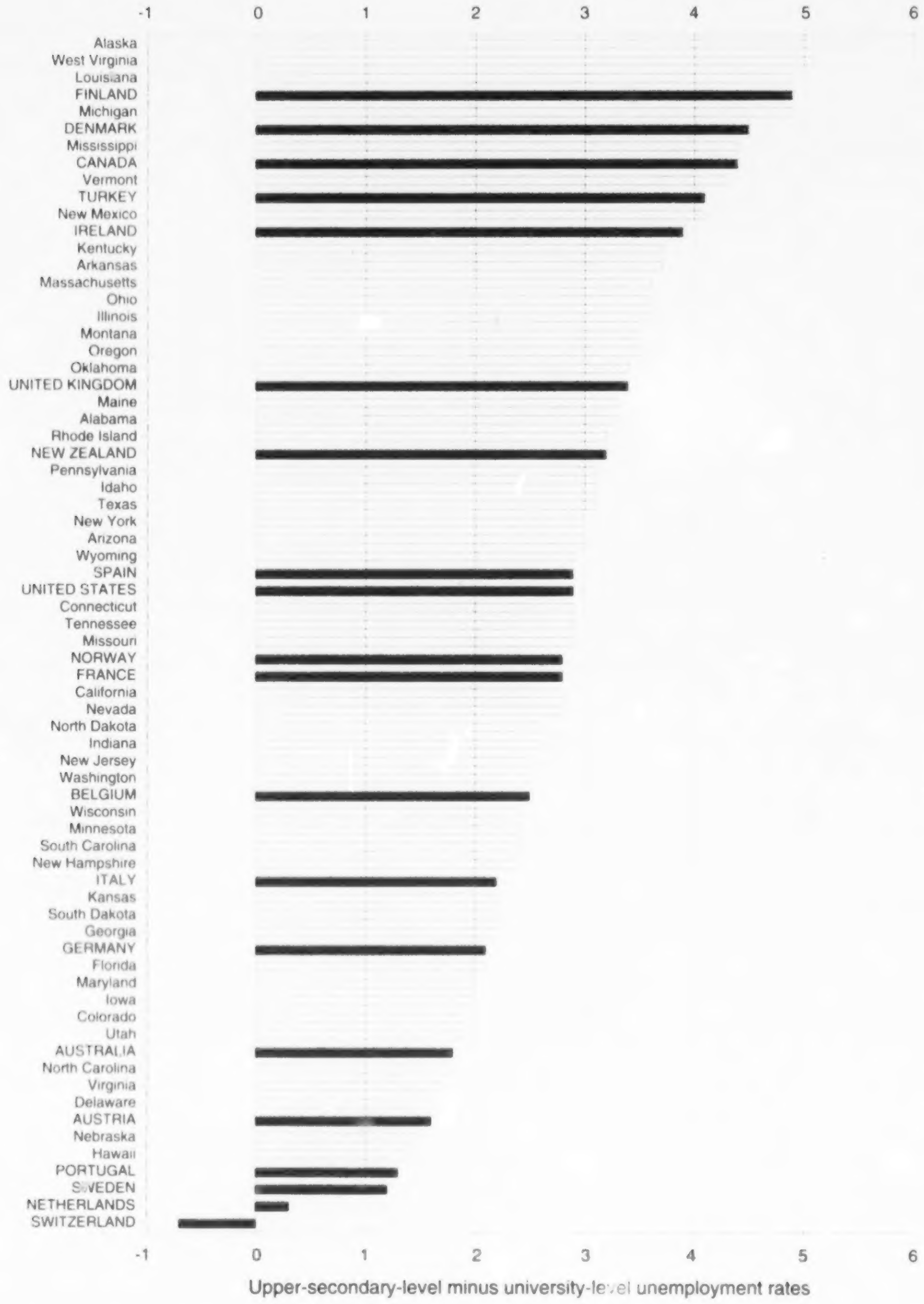
- **The difference in unemployment rates between those having attained an upper secondary and a university level of education was 2.9 percentage points in the United States, about the same as in France. Among the G–7 countries represented here, Canada and the United Kingdom had larger differences (4.4 and 3.4 percentage points, respectively). Italy and Germany had smaller differences (2.2 and 2.1 percentage points, respectively).**

- **The difference in unemployment rates between those having attained an upper secondary and a university level of education ranged across the states from about 1.5 percentage points in Hawaii and Nebraska to over 5 percentage points in Alaska and West Virginia. The range across the countries was somewhat wider and lower — from -0.7 percentage points in Switzerland to 4.9 percentage points in Finland.**

Note on interpretation:

Unemployment rates are volatile measures, highly (negatively) correlated with business cycles. The United States' unemployment rate in (October of) 1991 was higher than the unemployment rates in most of the states in (April of) 1990 because unemployment tends to lag behind recessions. The U.S. recession occurred during the last two quarters of 1990 and the first quarter of 1991. U.S. unemployment averaged less than 7 million workers in 1990, but almost 8.7 million in October 1991. The U.S. national unemployment rate was 5.3 percent of all workers in April 1990 and 6.7 percent in October 1991. Unemployment did not peak in Western and Northern Europe until late 1993.

Figure 26: Difference in unemployment rates between persons aged 25 to 64 having attained an upper secondary and a university level of education, by country (1991) and state (1990)



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table R9. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table 26a: Unemployment rates among persons aged 25 to 64, by level of educational attainment and country: 1991

Country	Less than upper secondary	Upper secondary	Higher education (non-university)	Higher education (university)
Australia	9.1	6.0	6.6	4.2
Austria	4.8	3.1	—	1.5
Belgium	11.8	4.2	2.3	1.7
Canada	14.1	9.5	7.8	5.1
Denmark	14.2	9.1	5.7	4.6
Finland	8.6	7.0	2.9	2.1
France	10.6	6.6	3.6	3.8
Germany	10.5	6.6	4.6	4.5
Ireland	20.3	7.3	4.9	3.4
Italy	5.7	7.2	—	5.0
Netherlands	8.6	4.9	4.2	4.6
New Zealand	10.9	7.4	5.3	4.2
Norway	6.7	4.4	2.3	1.6
Portugal	3.9	3.1	0.8	1.8
Spain	13.7	12.2	—	9.3
Sweden	2.6	2.3	1.1	1.1
Switzerland	1.3	1.5	0.8	2.2
Turkey	5.7	7.2	—	3.1
United Kingdom	10.4	6.5	3.7	3.1
United States[*]	10.4	5.1	3.4	2.2

— Persons are included in counts of another level of education.

[*] 1990 data.

NOTE: See supplemental note to Indicator 26 on pp. 231-233 for a discussion of levels of education; on pp. 243-248 for details on data provided by Australia, Austria, Belgium, Canada, Czechoslovakia, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States; and for a discussion comparing educational attainment data for the United States as it is found in the Current Population Survey to the same in the 1990 U.S. Census of Population.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table R9. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table 26b: Unemployment rates among persons aged 25 to 64, by level of educational attainment and state: 1990

State	Less than upper secondary	Upper secondary	Higher education (non-university)	Higher education (university)
Alabama	9.5	5.2	4.5	1.8
Alaska	16.9	8.2	4.1	2.5
Arizona	12.0	5.7	4.6	2.7
Arkansas	8.5	5.2	3.7	1.6
California	11.5	5.2	3.6	2.4
Colorado	10.0	4.6	3.7	2.7
Connecticut	9.8	4.9	3.2	2.0
Delaware	7.1	2.9	1.4	1.3
District of Columbia	13.0	6.7	5.4	2.1
Florida	8.6	4.6	3.2	2.5
Georgia	7.6	4.2	2.9	2.0
Hawaii	5.6	2.9	1.8	1.4
Idaho	9.4	4.8	3.6	1.7
Illinois	12.1	5.6	3.7	2.1
Indiana	8.5	4.3	2.9	1.6
Iowa	7.7	3.7	2.7	1.7
Kansas	8.9	3.7	2.5	1.5
Kentucky	10.6	5.2	2.6	1.5
Louisiana	15.0	7.1	5.7	2.1
Maine	12.5	5.7	3.3	2.4
Maryland	8.0	3.5	2.1	1.5
Massachusetts	12.0	6.5	4.1	2.9
Michigan	15.2	7.0	4.2	2.2
Minnesota	9.4	4.7	3.1	2.3
Mississippi	11.0	6.2	3.8	1.8
Missouri	10.7	4.8	3.3	2.0
Montana	11.1	5.9	3.7	2.3
Nebraska	5.1	2.8	2.0	1.3
Nevada	8.6	5.1	3.9	2.3
New Hampshire	10.4	5.3	3.5	2.9
New Jersey	10.0	4.9	3.1	2.3
New Mexico	12.8	6.4	4.1	2.4
New York	11.5	5.9	3.9	2.8
North Carolina	5.9	3.5	2.1	1.7
North Dakota	8.0	4.8	2.5	2.2
Ohio	11.0	5.4	3.7	1.8
Oklahoma	10.7	5.5	4.3	2.1
Oregon	10.4	5.7	3.6	2.2
Pennsylvania	9.7	5.2	3.4	2.1
Rhode Island	10.2	5.9	3.9	2.6
South Carolina	7.6	3.9	2.1	1.5
South Dakota	6.5	3.7	2.0	1.6
Tennessee	8.5	4.8	2.8	1.9
Texas	11.2	5.3	3.8	2.3
Utah	8.6	3.8	3.0	1.9
Vermont	9.0	6.2	2.9	1.9
Virginia	6.7	3.3	2.1	1.6
Washington	10.7	5.0	3.5	2.5
West Virginia	15.5	7.3	5.0	2.2
Wisconsin	9.8	4.4	3.0	1.9
Wyoming	9.9	4.6	4.1	1.7

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Indicator 27: Education and earnings

This measure examines the relationship between education and earnings among persons in their prime earning years — from ages 25 to 64. The measure is the ratio of average annual earnings at a particular highest level of educational attainment to the average annual earnings of persons whose highest level of educational attainment is an upper secondary school degree, multiplied by 100. For example, in a nation or state in which persons with an upper secondary education earn an average annual income of $20,000, a ratio of 69 for persons with less than an upper secondary education would indicate that those persons earned $13,800, or 69 percent of what persons with an upper secondary degree earned. The earnings ratio for persons with an upper secondary degree is always 100. This earnings ratio represents the impact that attaining various levels of education may have on one's earnings and, by extension, on the potential quality of one's life. It also is an indication of the demand a nation or state has for workers at particular levels of educational attainment relative to those with an upper secondary level of education.

- **In all states and nations around 1990, higher levels of education resulted in higher average annual earnings. In addition, investment in education beyond the upper secondary level resulted in greater increased earnings than a lack of an upper secondary credential resulted in decreased earnings.**

- **In 46 U.S. states, the difference in average annual earnings between males with university degrees and those with less than an upper secondary degree was greater than the same difference in 8 of the 11 other countries. In contrast, the same was true in only 15 states regarding female earnings.**

- **In 36 U.S. states, lack of an upper secondary credential for males was more costly than in 10 of the 11 other reporting countries.**

- **In all states but Utah, the earnings ratio for persons with non-university higher education degrees was higher for females than for males.**

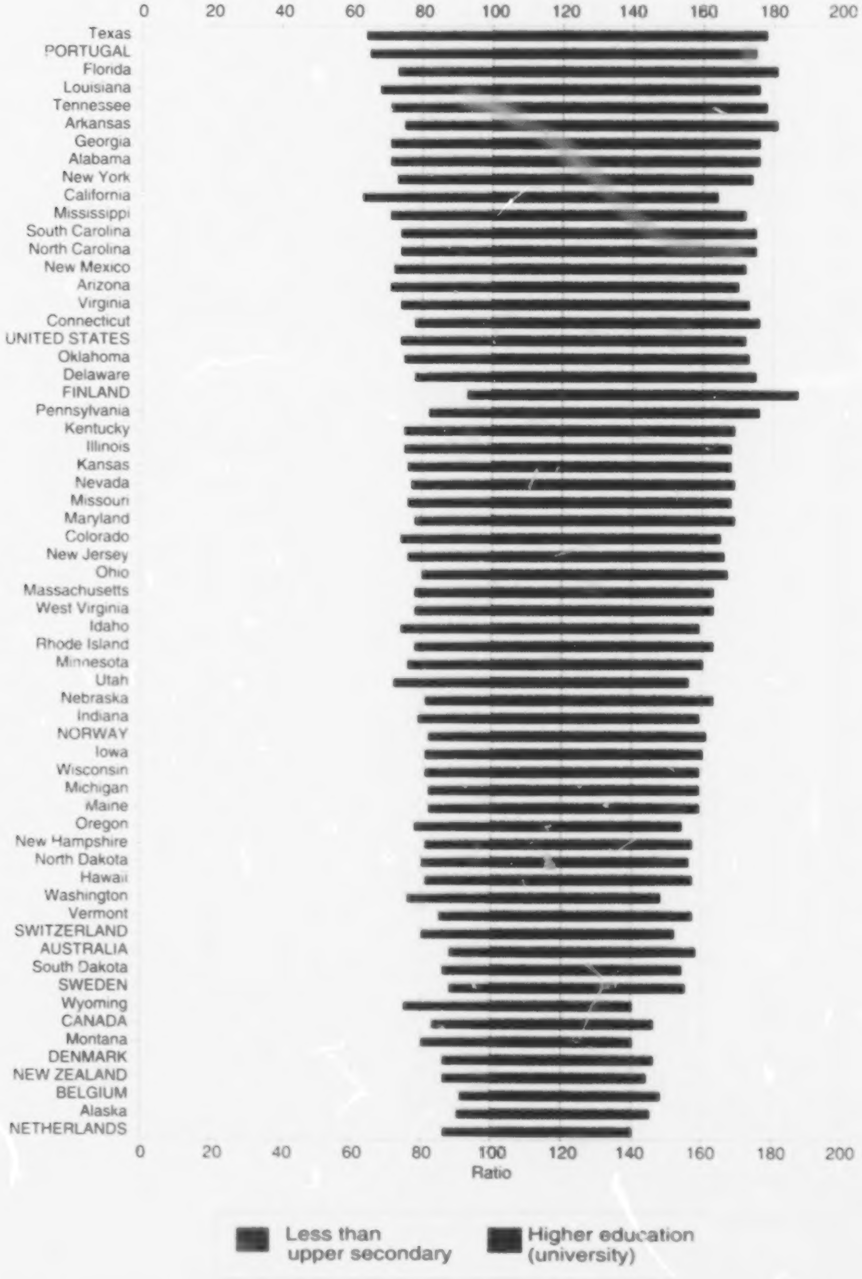
Notes on interpretation:

Although the educational attainment of a population is an indicator of its current skill level, it is not necessarily a measure of success in educating a large proportion of the population. Within the 25- to 64-year-old age group, there may be many who have moved out of the country or state where they received their education. Thus, particularly in some U.S. states, large segments of the resident population may have been educated elsewhere.

Education represents an intangible investment in human skills that may produce benefits for the individual and society. These benefits may include higher earnings from work if employers demand these skills and are willing to pay for them. The earnings advantage that more highly educated persons have, compared to others, can be viewed as part of the economic return to individuals' investment in education. This return is greater as the earnings advantage of more highly educated persons increases.

Care must be taken in using this indicator as a measure of the rate of return to individuals' investment in education. Earnings are influenced by many factors, for example the balance between labor demand and supply. Also, a calculation of the rate of return must take account of the costs to individuals of obtaining additional education. These costs include tuition and other costs of attending college, along with earnings foregone by not working (or working part-time) while attending school. If these costs are similar in two countries, then higher levels of earnings will generally represent a higher rate of return. If the costs differ, higher earnings may reflect differences in the costs of obtaining additional education as well as a higher rate of return.

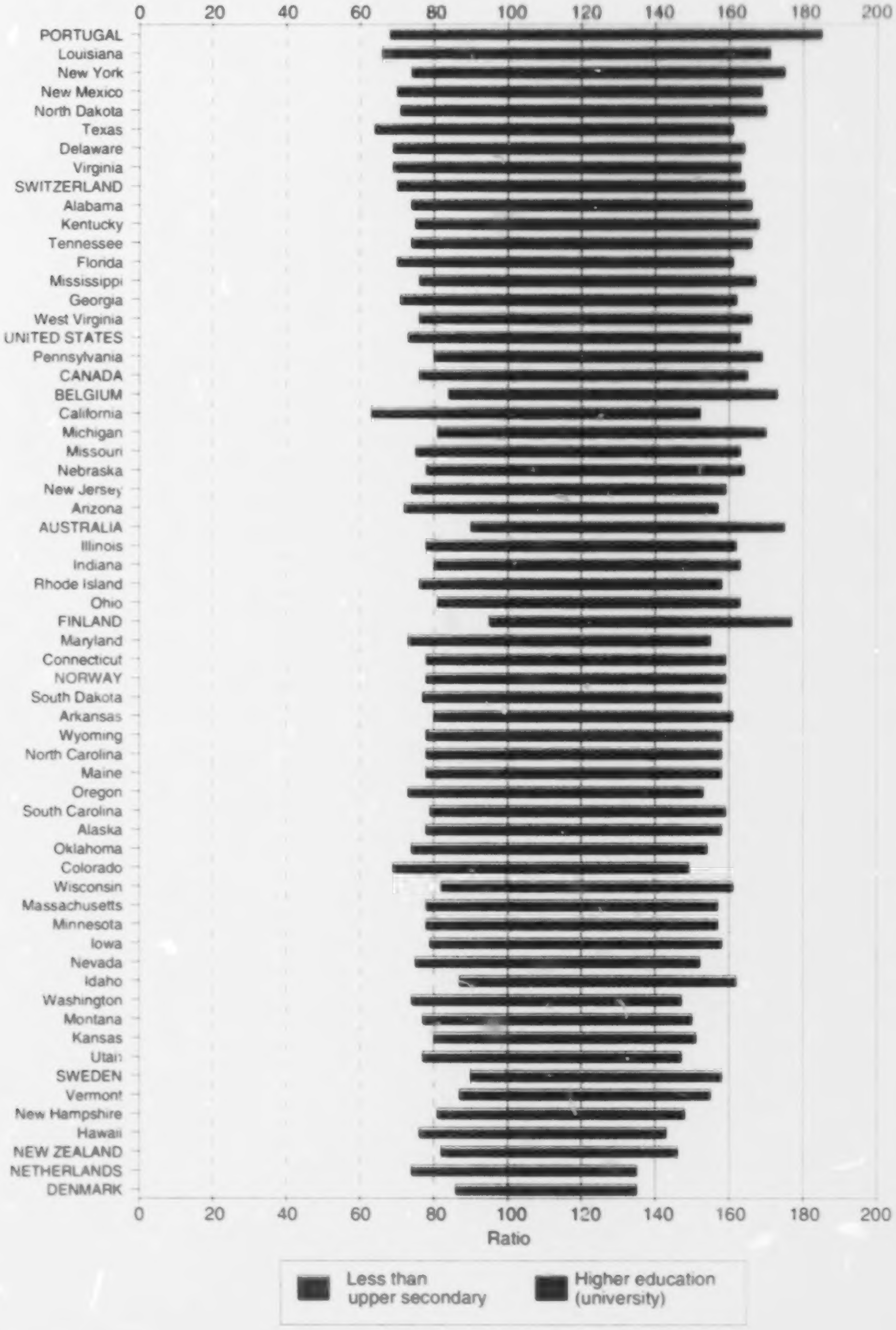
Figure 27a: Ratio of average annual earnings to those with an upper secondary level of education (times 100) for males aged 25 to 64, by level of educational attainment, country (various years) and state (1990)



NOTE: States and nations are sorted from high to low according to the difference in mean annual earnings between those with a university level education and those with less than an upper secondary level of education. Looked at graphically, states and nations are sorted from high to low according to the width of their bar.

SOURCE: Organization for Economic Co operation and Development, Center for Educational Research and Innovation, *Education at a Glance*, Table R10(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Figure 27b: Ratio of average annual earnings to those with an upper secondary level of education (times 100) for females aged 25 to 64, by level of educational attainment, country (various years) and state (1990)



NOTE: States and nations are sorted from high to low according to the difference in mean annual earnings between those with a university level and those with less than an upper secondary level of education. Looked at graphically, states and nations are sorted from high to low according to the width of their bar.

SOURCE: *Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993*, Table R10(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table 27a: Ratio of average annual earnings to those of persons aged 25 to 64 with an upper secondary level of education (times 100), by sex, level of educational attainment, and country: Various years

		Male			Female		
Country	Year	Less than upper secondary	Higher education (non-university)	Higher education (university)	Less than upper secondary	Higher education (non-university)	Higher education (university)
Australia	1991	88	121	158	90	124	175
Belgium	1992	91	119	148	84	139	173
Canada	1990	83	110	146	76	115	165
Denmark	1990	86	110	146	86	111	135
Finland	1990	93	130	187	95	131	177
Netherlands	1989	86	118	140	74	107	135
New Zealand	1991	86	110	144	82	104	146
Norway	1991	82	132	161	78	135	159
Portugal	1991	65	124	175	68	114	185
Sweden	1990	88	120	155	90	118	158
Switzerland	1990	80	129	152	70	127	164
United States*	1990	74	112	172	73	120	163

*1990 data.

NOTE: See supplemental note to Indicator 27 on pp. 291-292 for details on earnings data provided by Austria, Belgium, Portugal, and Switzerland; on pp. 231-233 for a discussion of levels of education; on pp. 243-248 for details on educational attainment data provided by Australia, Belgium, Canada, Finland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, and the United States; and for a discussion comparing educational attainment data for the United States as it is found in the Current Population Survey to the same in the 1990 U.S. Census of Population.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table R10(A). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table 27b: Ratio of average annual earnings to those of persons aged 25 to 64 with an upper secondary level of education (times 100), by sex, level of educational attainment, and state: 1990

State	Male			Female		
	Less than upper secondary	Higher education (non-university)	Higher education (university)	Less than upper secondary	Higher education (non-university)	Higher education (university)
Alabama	71	103	176	74	121	166
Alaska	90	115	145	78	119	158
Arizona	71	110	170	72	116	157
Arkansas	75	111	181	80	134	161
California	63	111	164	63	113	152
Colorado	74	106	165	69	112	149
Connecticut	78	113	176	78	120	159
Delaware	78	112	175	69	126	164
District of Columbia	81	123	218	69	116	173
Florida	73	112	181	70	125	161
Georgia	71	117	176	71	127	162
Hawaii	81	113	157	76	117	143
Idaho	74	101	159	87	117	162
Illinois	75	108	168	78	114	162
Indiana	79	107	159	80	123	163
Iowa	81	104	160	79	115	158
Kansas	76	108	168	80	117	151
Kentucky	75	113	169	75	135	168
Louisiana	68	105	176	66	135	171
Maine	82	115	159	78	121	158
Maryland	78	112	169	73	118	155
Massachusetts	78	115	163	78	120	157
Michigan	82	113	159	81	122	170
Minnesota	76	104	160	78	115	157
Mississippi	71	106	172	76	124	167
Missouri	76	111	168	75	125	163
Montana	80	107	140	77	125	150
Nebraska	81	104	163	78	114	164
Nevada	77	110	169	75	123	152
New Hampshire	81	113	157	81	119	148
New Jersey	76	109	166	74	121	159
New Mexico	72	118	172	70	124	169
New York	73	110	174	74	117	175
North Carolina	74	115	175	78	123	158
North Dakota	80	102	156	71	131	170
Ohio	80	109	167	81	124	163
Oklahoma	75	113	173	74	124	154
Oregon	78	105	154	73	117	153
Pennsylvania	82	116	176	80	123	169
Rhode Island	78	109	163	76	121	158
South Carolina	74	116	175	79	127	159
South Dakota	86	101	154	77	124	158
Tennessee	71	114	178	74	128	166
Texas	64	111	178	64	120	161
Utah	72	108	156	77	107	147
Vermont	85	114	157	87	119	155
Virginia	74	110	173	69	119	163
Washington	76	103	148	74	113	147
West Virginia	78	108	163	76	136	166
Wisconsin	81	107	159	82	119	161
Wyoming	75	101	140	78	117	158

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Indicator 28: Gender differences in earnings

This indicator reflects the difference in earnings between males and females who have attained equal levels of education in a state or nation. Gender differences in earnings are measured by the ratio of the average annual earnings of women to men in the 25- to 64-year-old age cohort by level of educational attainment. A gap in the earnings levels between males and females may illustrate existing occupational gender roles in the workforce or may reflect societal attitudes toward the relative skill levels of males and females performing the same job. Within a range of occupations requiring similar amounts of schooling, certain occupations with lower earnings may traditionally be associated with and pursued by females.

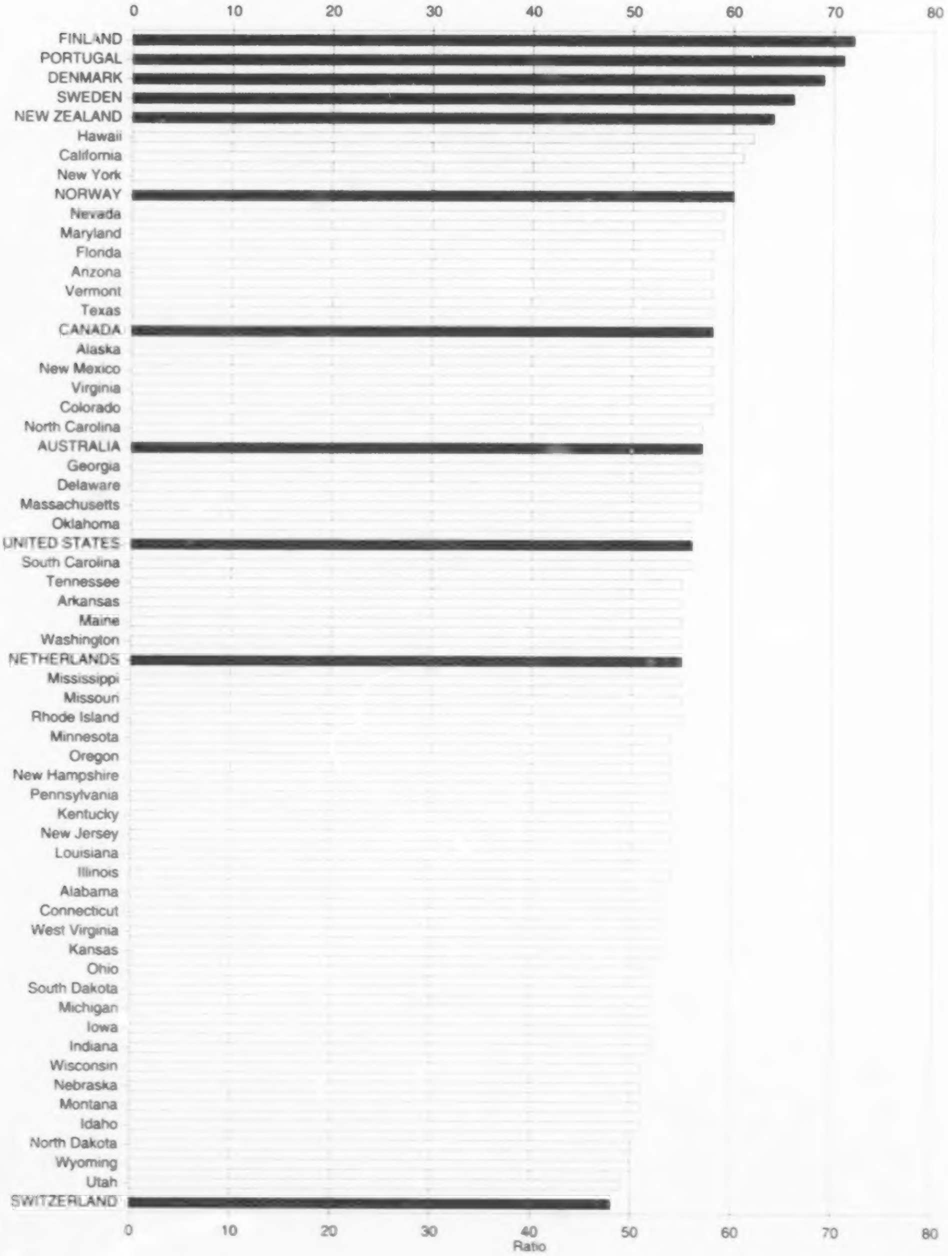
- **In all countries and states around 1990, the average annual earnings for females was less than that of males with the same level of educational attainment.**
- **For all levels of educational attainment except non-university higher education, at least half of the other countries reported as high or higher ratios of average annual earnings of females to males than did the U.S. state with the highest ratio.**
- **Among those whose highest level of educational attainment was at least a university degree, forty-eight states had female:male ratios of average annual earnings below all but two other countries. Forty-one of these states had ratios lower than any other country.**
- **In some states and nations (such as Canada and Alaska), the female-to-male earnings ratio increased consistently with higher levels of educational attainment. In Utah it decreased consistently. In other states and nations, the relationship among the female-to-male earnings ratios across the levels of educational attainment was flat or inconsistent.**

Notes on interpretation:

There are marked differences among countries with respect to whether certain programs are classified as belonging to the university, non-university, or upper secondary sector. For example, in some countries, programs leading to qualifications in teaching and nursing are considered to be university programs; in others, they are non-university programs. Furthermore, some programs that are begun subsequent to the completion of general secondary education are classified as non-university higher education in parts of Canada and the United States, whereas they are defined as upper secondary education in most other countries. To the extent that enrollment in any of these programs tend to be dominated by one gender, that can distort comparisons across countries using this indicator. For example, if most nursing students are female in each of two countries, but one country classifies nursing education as a university program while the other classifies it as non-university higher education, the first country may have a higher female proportion at the university level and a lower female proportion at the non-university higher education level. Furthermore, if nurses have relatively high earnings, the level of educational attainment to which nursing graduates are assigned will have a relatively higher female-to-male earnings ratio.

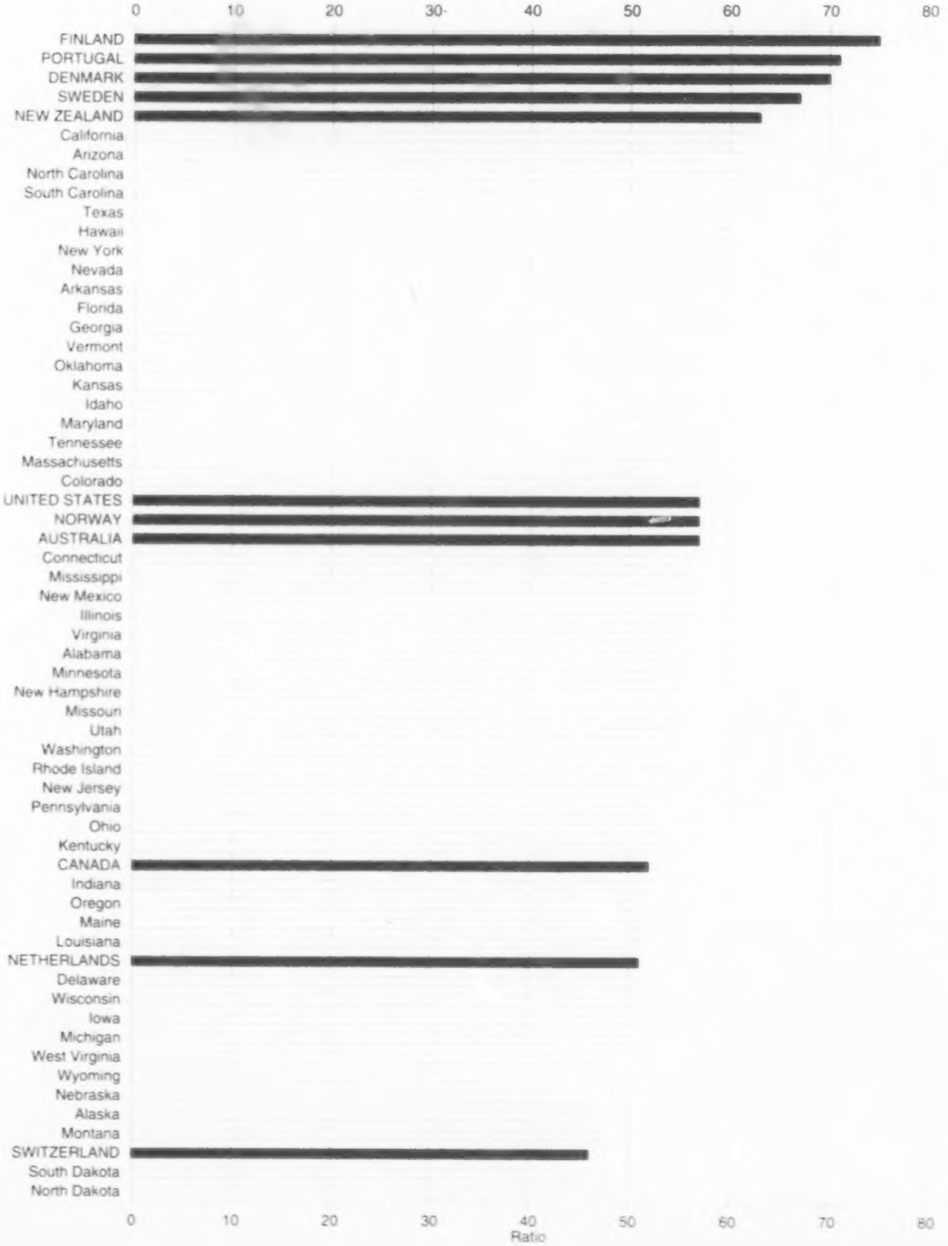
A group of females at the same level of educational attainment as a group of males may have lower average earnings because they differ in other characteristics — average age, years of job experience, or full-time/part-time status, for instance — that are also highly correlated with earnings levels.

Figure 28a: **Ratio of mean annual earnings of females to males (times 100) among all persons aged 25 to 64, by country (various years) and state (1990)**



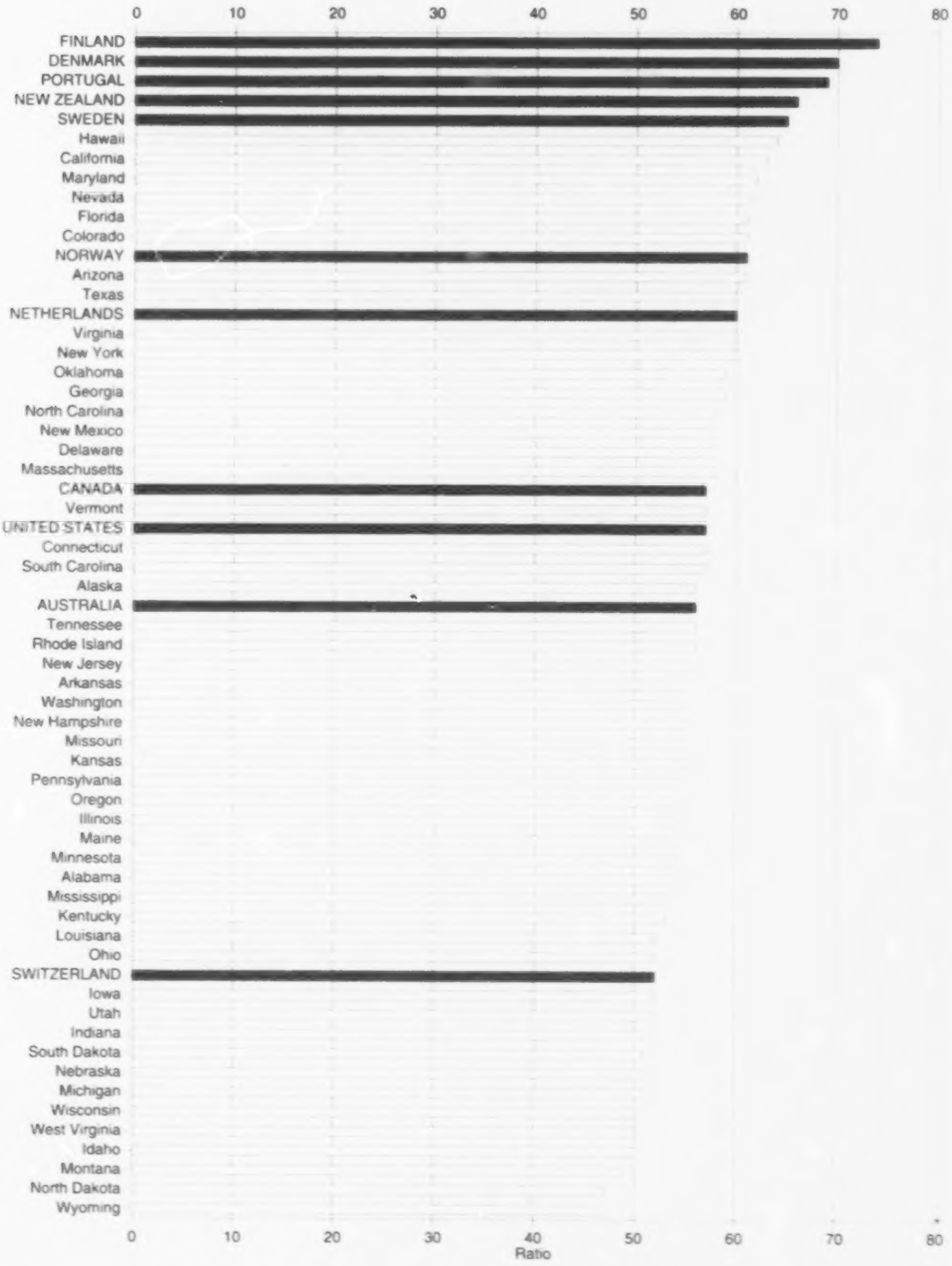
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table R10(B). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Figure 28b: **Ratio of mean annual earnings of females to males (times 100) among persons aged 25 to 64 whose highest level of educational attainment is less than upper secondary, by country (various years) and state (1990)**



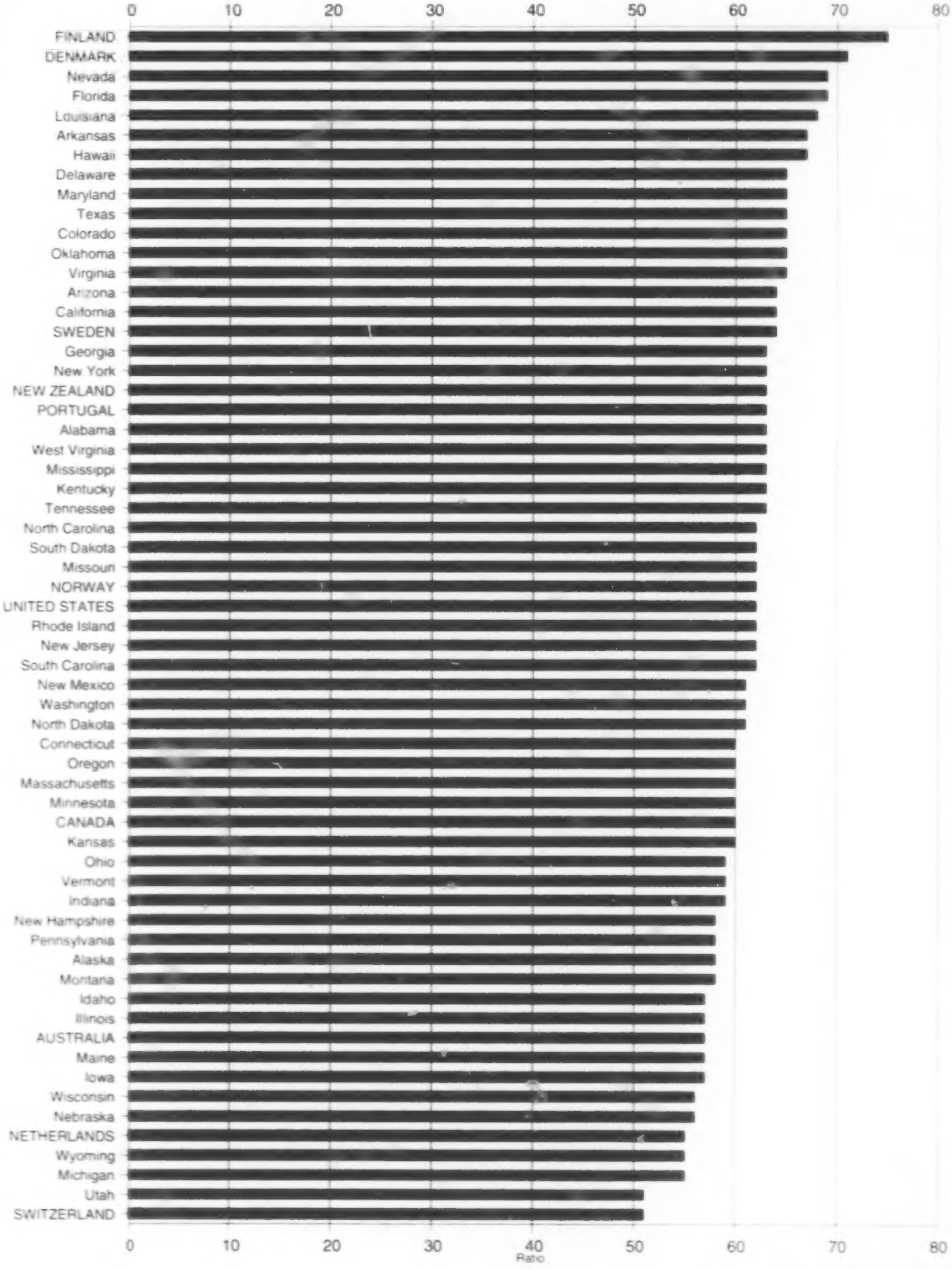
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table R10(B). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Figure 28c: Ratio of mean annual earnings of females to males (times 100) among persons aged 25 to 64 whose highest level of educational attainment is upper secondary, by country (various years) and state (1990)



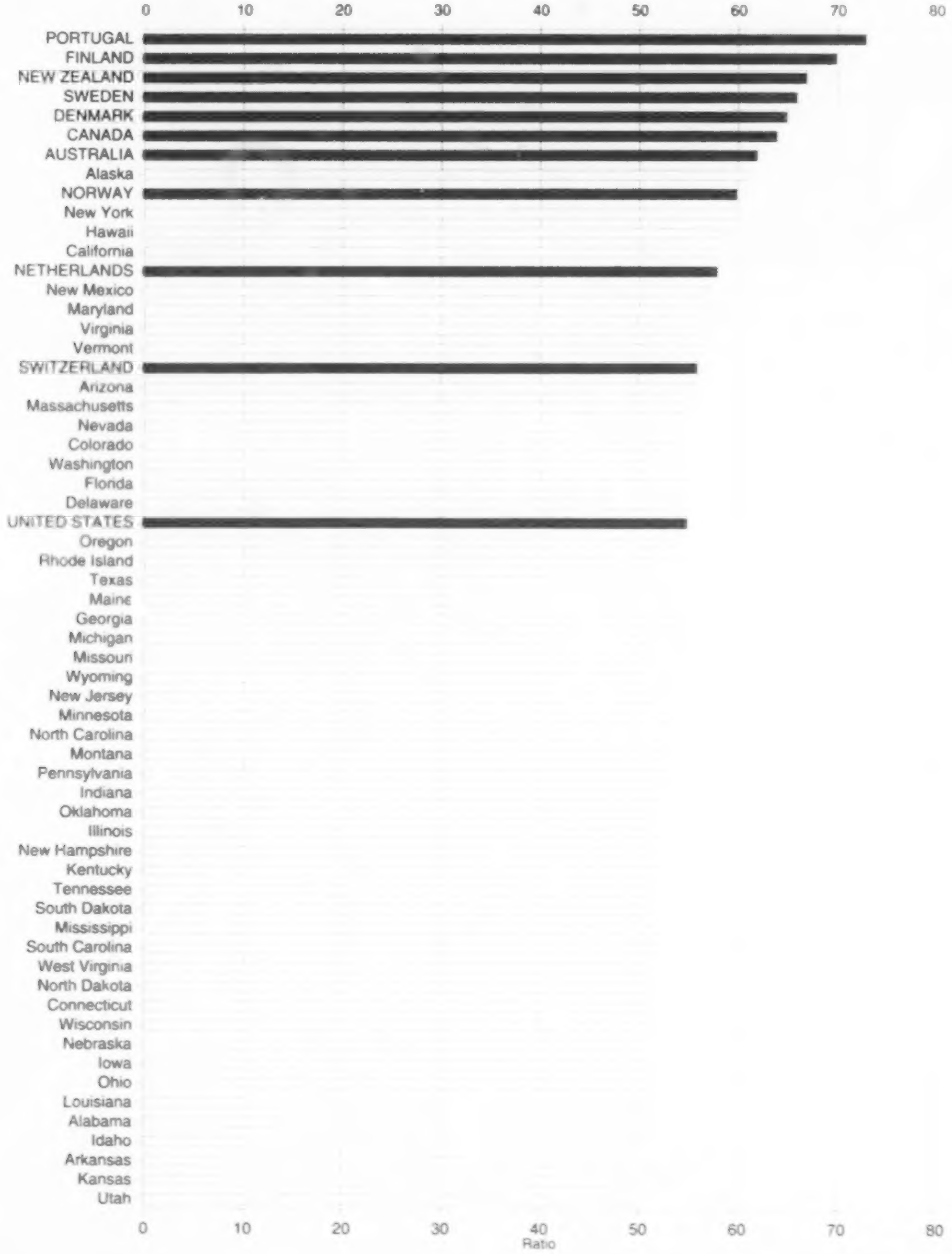
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table R10(B). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Figure 28d: Ratio of mean annual earnings of females to males (times 100) among persons aged 25 to 64 whose highest level of educational attainment is non-university higher education, by country (various years) and state (1990)



SOURCE: *Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993,* Table R10(B). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Figure 28e: **Ratio of mean annual earnings of females to males (times 100) among persons aged 25 to 64 whose highest level of educational attainment is at least university level, by country (various years) and state (1990)**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993*, Table R10(B). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table 28a: Ratio of mean annual earnings of females to males (times 100) among persons aged 25 to 64, by level of educational attainment and country: Various years

Country	Year	All levels	Less than upper secondary	Upper secondary	Higher education (non-university)	Higher education (university)
Australia	1991	57	57	56	57	62
Canada	1990	58	52	57	60	64
Denmark	1990	69	70	70	71	65
Finland	1990	72	75	74	75	70
Netherlands	1989	53	51	60	55	58
New Zealand	1991	64	63	66	63	67
Norway	1991	60	57	61	62	60
Portugal	1991	71	71	69	63	73
Sweden	1990	66	67	65	64	66
Switzerland	1990	49	46	52	51	56
United States*	1990	56	57	57	62	55

*1990 data.

NOTE: See supplemental note to Indicator 28 on pp. 291-292 for details on earnings data provided by Austria, Belgium, Portugal, and Switzerland; on pp. 231-233 for a discussion of levels of education; on pp. 243-248 for details on data provided by Australia, Canada, Finland, the Netherlands, New Zealand, Norway, Portugal, Sweden, and the United States; and for a discussion comparing educational attainment data for the United States as it is found in the Current Population Survey to the same in the 1990 U.S. Census of Population.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table R10(B). U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table 28b: Ratio of mean annual earnings of females to males (times 100) among persons aged 25 to 64, by level of educational attainment and state: 1990

State	All levels	Less than upper secondary	Upper secondary	Higher education (non-university)	Higher education (university)
Alabama	53	56	54	63	51
Alaska	58	48	56	58	61
Arizona	58	61	61	64	56
Arkansas	55	60	55	67	49
California	61	63	63	64	58
Colorado	58	57	61	65	55
Connecticut	53	56	57	60	51
Delaware	57	51	58	65	55
District of Columbia	75	76	90	84	71
Florida	58	59	61	69	55
Georgia	57	59	59	63	54
Hawaii	62	60	64	67	59
Idaho	51	58	50	57	51
Illinois	54	56	54	57	52
Indiana	52	52	51	59	52
Iowa	52	51	52	57	51
Kansas	53	58	55	60	49
Kentucky	54	53	53	63	52
Louisiana	54	51	52	68	51
Maine	55	51	54	57	54
Maryland	59	58	62	65	57
Massachusetts	57	58	58	60	55
Michigan	52	50	51	55	54
Minnesota	54	55	54	60	53
Mississippi	55	56	53	63	52
Missouri	55	55	55	62	54
Montana	51	47	49	58	53
Nebraska	51	49	51	56	51
Nevada	59	60	62	69	55
New Hampshire	54	55	55	58	52
New Jersey	54	54	56	62	53
New Mexico	58	56	58	61	57
New York	60	60	60	63	60
North Carolina	57	61	58	62	53
North Dakota	50	42	47	61	51
Ohio	52	53	52	59	51
Oklahoma	56	58	59	65	52
Oregon	54	51	54	60	54
Pennsylvania	54	53	55	58	53
Rhode Island	55	54	56	62	54
South Carolina	56	60	57	62	52
South Dakota	52	45	51	62	52
Tennessee	55	58	56	63	52
Texas	58	60	60	65	54
Utah	49	55	52	51	49
Vermont	58	58	57	59	56
Virginia	58	56	60	65	56
Washington	55	54	55	61	55
West Virginia	53	49	50	63	51
Wisconsin	51	51	50	56	51
Wyoming	50	49	47	55	53

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Indicator 29: New scientists and engineers

The "production" of new scientists and engineers in a state or nation is measured here by the ratio of university science and engineering graduates (as measured by the number of bachelor's degrees in the United States and equivalent first university degrees in other countries) to the number of 22-year-olds (a typical age for university graduation) in that state or nation. This graduation ratio is influenced both by the relative emphasis on science and engineering among all possible degrees and by the absolute number of university degrees conferred in a nation or state. It also reflects both the level of technical skill of society and the magnitude of technical resources it has available, and the labor market opportunities available for graduates.

- **The number of U.S. university students who graduated with science or engineering degrees amounted to about 5 per 100 22-year-olds in 1991. Among the G–7 countries in various years between 1988 and 1991, Japan produced a higher ratio of science and engineering graduates, while Canada's and Germany's were about the same as that of the United States.**

- **Among 31 countries surveyed, 19 reported 4 or fewer degrees in science or engineering per 100 persons age 22. Only 8 U.S. states reported ratios that low.**

- **Among the G–7 countries, only Canada had as low a percentage of science and engineering degrees of all first university degrees as the United States. Seventeen percent of all U.S. bachelor's degrees in 1991 were in science and engineering fields compared to 47 percent for Germany and 40 percent for France.**

- **Among the 30 other countries represented here, 21 of them showed larger percentages of first university degrees in science and engineering than did Montana, the state with the largest proportion.**

Notes on interpretation:

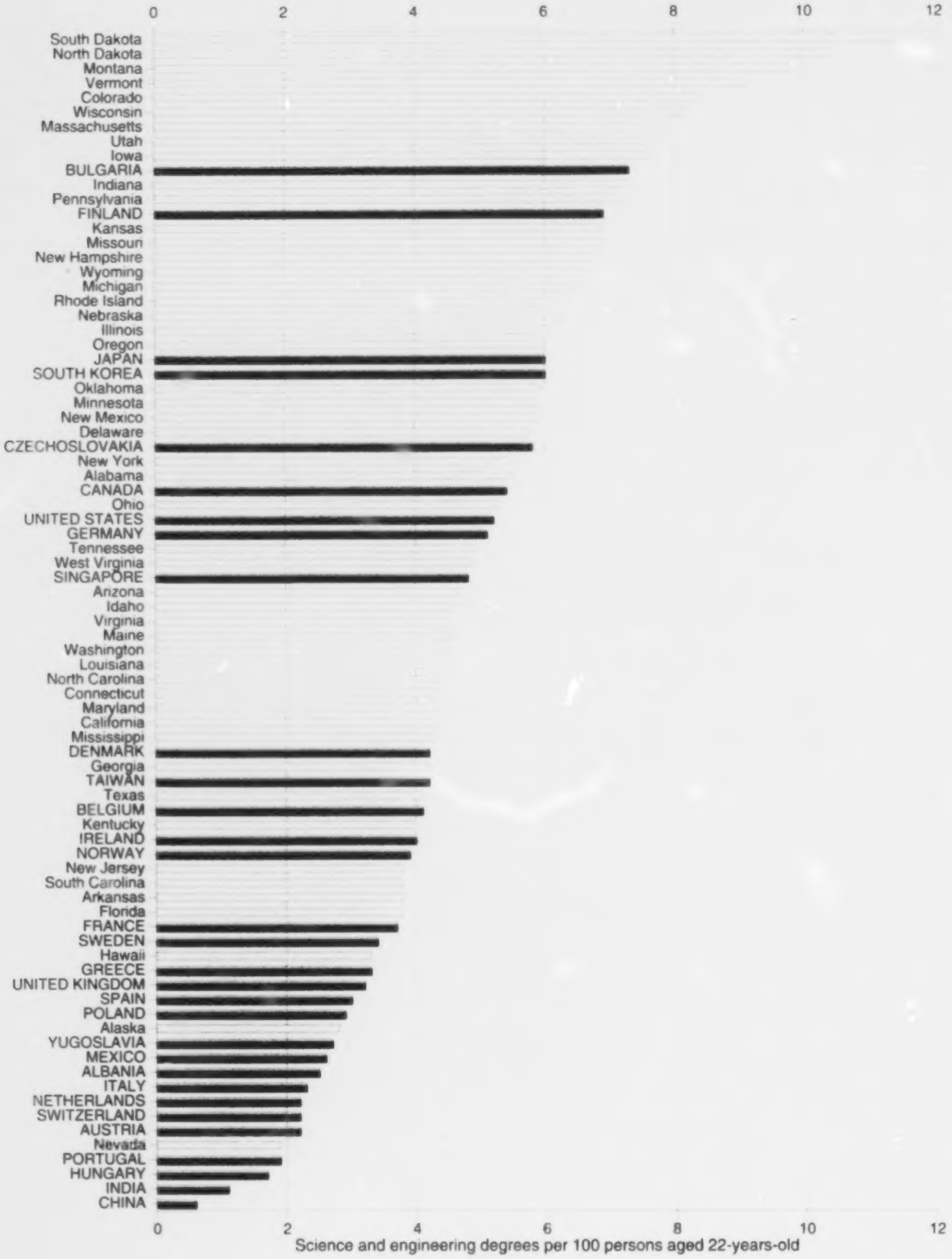
The natural sciences include agricultural, biological, physical, environmental, mathematical, and computer sciences. Health and social sciences are excluded.

Countries vary in the manner in which they classify higher-level training programs as either university or non-university higher education programs. Equivalent programs at equivalent "polytechnics," technical, or vocational colleges may be classified as university programs in one country, in which case they would be represented in this indicator, but as non-university higher education programs in another country, in which case they would not be represented here.

Graduation ratios should *not* be interpreted as graduation *rates*. Graduation ratios allow comparisons across states and nations by standardizing the number of graduates at a particular education level to the size of the population in an age group typical for graduation at that level. It is not, however, an estimate of the percentage of that age group who graduate at that level. See supplemental note on pages 233–236 for a discussion of graduation reference ages. See Indicator 24 for a listing of the names of first university degrees (the equivalents to the U.S. bachelor's) for each of the OECD countries.

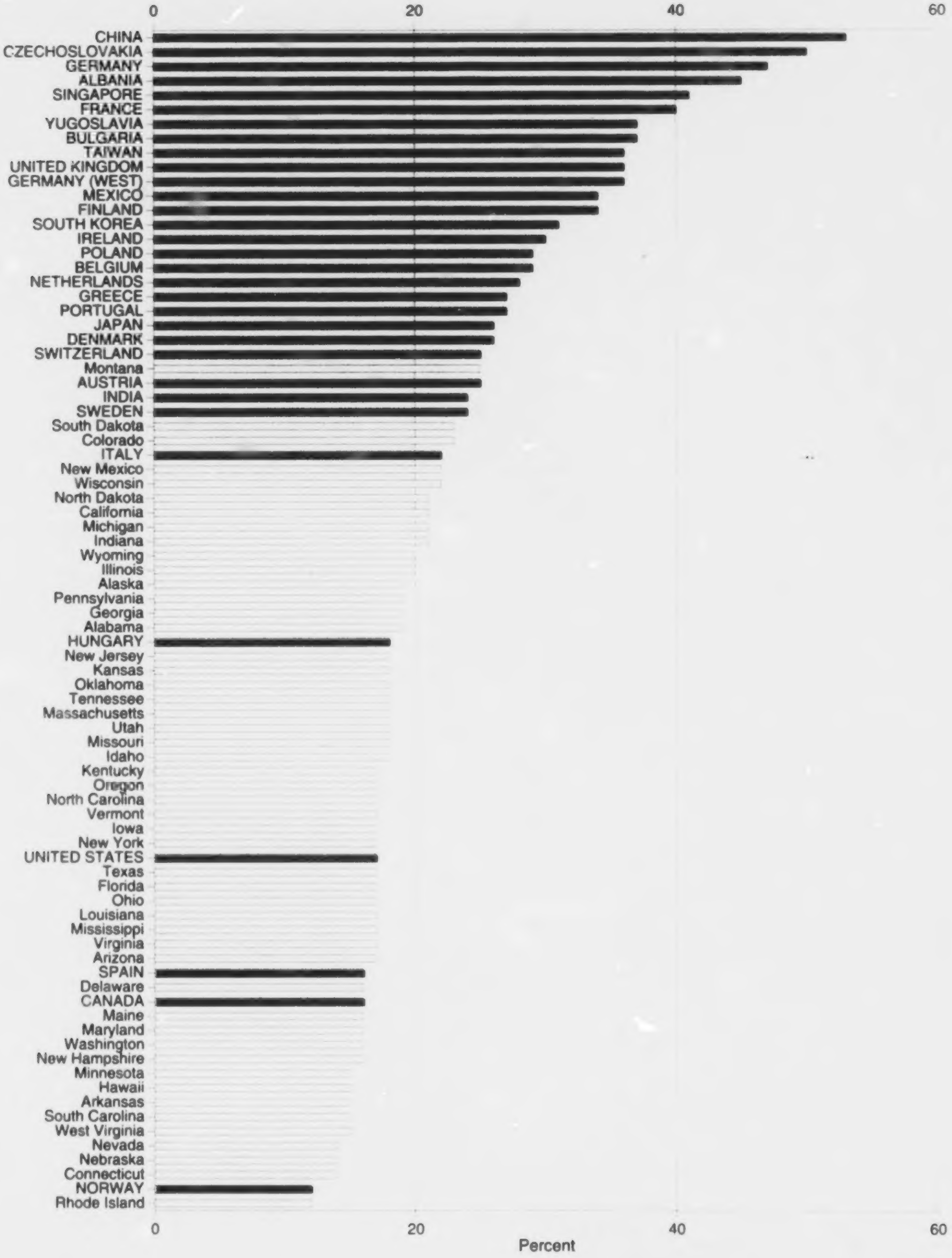
All students completing bachelor's degrees (or the equivalent) in country or state universities are included in the higher education completion figures. That includes students who had lived in other countries or states before attending their university or who moved to other countries or states after attending their university. Some states and countries, particularly those with a relatively large public university system and many private universities, may have a surplus of "in-migrant" students. Other states and countries, particularly those with a relatively small public university system and few private universities, may have a deficit of "out-migrant" students. See Indicator 11 for a migration adjustment across U.S. states, made at the initial point of that migration — when students first enter higher education institutions.

Figure 29a: **Graduates with first university degrees in science or engineering per 100 persons 22 years old, by country and state: Various years (1989 to 1991)**



SOURCE: National Science Foundation, *Science and Engineering Indicators*, 1993, Appendix Table 2-1, updated 1994. U.S. Department of Education, National Center for Education Statistics, *Degrees in Science and Mathematics*, Tables 3-2, 4-3, 5-9, and 5-10. U.S. Department of Commerce, Bureau of the Census, 1990 Census of the Population and Housing.

Figure 29b: Percentage of all first university degrees in science and engineering, by country and state: Various years (1989 to 1991)



SOURCE: National Science Foundation, *Science and Engineering Indicators*, 1993, Appendix Table 2-2, updated 1994. U.S. Department of Education, National Center for Education Statistics, *Degrees in Science and Mathematics*, Tables 3-2, 4-3, 5-9, and 5-10; *Digest of Education Statistics, 1993*, Table 236.

Table 29a: Graduates with first university degrees and with first university degrees in science and engineering per 100 persons 22 years old, and the percentage of first university degrees in science and engineering, by country: Various years (1989 to 1991)

		Per 100 22-year-olds		
Country	Year	First university degrees	Science and engineering first university degrees[*]	Percent of all first university degrees in science and engineering
Albania	1989	5.5	2.5	45
Austria	1991	9.1	2.2	25
Belgium	1988	14.0	4.1	29
Bulgaria	1990	19.6	7.3	37
Canada	1990	33.2	5.4	16
China	1990	1.2	0.6	53
Czechoslovakia	1989	11.6	5.8	50
Denmark	1990	17.7	4.2	26
Finland	1991	20.8	6.9	34
France	1990	9.2	3.7	40
Germany	1990	10.9	5.1	47
Greece	1991	11.9	3.3	27
Hungary	1990	8.8	1.7	18
India	1990	4.8	1.1	24
Ireland	1990	12.8	4.0	30
Italy	1992	10.5	2.3	22
Japan	1991	22.4	6.0	26
Mexico	1990	7.6	2.6	34
Netherlands	1990	8.3	2.2	28
Norway	1990	31.0	3.9	12
Poland	1990	10.0	2.9	29
Portugal	1989	7.1	1.9	27
Singapore	1990	11.5	4.8	41
South Korea	1990	19.3	6.0	31
Spain	1990	18.6	3.0	16
Sweden	1991	14.5	3.4	24
Switzerland	1990	9.0	2.2	25
Taiwan	1990	11.6	4.2	36
United Kingdom	1991	8.9	3.2	36
United States	1991	30.9	5.2	17
Yugoslavia	1990	7.5	2.7	37

[*] Includes degrees in mathematics and agriculture, biological, physical, environmental, mathematical, and computer sciences. Health and social sciences are excluded.

NOTE: Data are compiled from numerous national and international sources and may not be strictly comparable. Degrees in different countries may not be academically equivalent. See supplemental note to Indicator 29 on p. 292 for details on data provided by several Asian and European countries, the Netherlands, Spain, the United Kingdom, and the United States; for an explanation of graduation reference age; and on pp. 233–236 for a discussion of enrollment reference groups and graduation references ages — typical years of completion for higher education.

SOURCE: National Science Foundation, *Science and Engineering Indicators, 1993*, Appendix Tables 2-1 and 2-2, updated 1994.

Table 29b: Bachelor's degrees and bachelor's degrees in science and engineering per 100 persons 22 years old, and the percentage of bachelor's degrees in science and engineering, by state: 1990

	Per 100 22-year-olds		
State	Bachelor's degrees	Science and engineering bachelor's degrees*	Percent of all bachelor's degrees in science and engineering
Alabama	29.7	5.5	19
Alaska	14.4	2.8	19
Arizona	27.0	4.7	17
Arkansas	24.6	3.8	15
California	21.0	4.3	21
Colorado	37.3	8.4	23
Connecticut	31.0	4.4	14
Delaware	35.7	5.8	16
District of Columbia	67.2	9.5	14
Florida	21.6	3.8	17
Georgia	22.0	4.2	19
Hawaii	21.9	3.3	15
Idaho	25.8	4.6	18
Illinois	30.9	6.1	20
Indiana	35.3	7.3	21
Iowa	43.9	7.7	17
Kansas	37.8	6.9	18
Kentucky	22.7	4.0	17
Louisiana	26.6	4.5	17
Maine	28.9	4.6	16
Maryland	27.2	4.4	16
Massachusetts	44.9	7.9	18
Michigan	31.4	6.5	21
Minnesota	38.9	5.9	15
Mississippi	24.5	4.3	17
Missouri	38.1	6.9	18
Montana	39.8	9.8	25
Nebraska	43.4	6.3	14
Nevada	13.6	1.9	14
New Hampshire	43.4	6.8	16
New Jersey	21.4	3.8	18
New Mexico	27.2	5.9	22
New York	34.3	5.7	17
North Carolina	25.7	4.4	17
North Dakota	48.9	10.4	21
Ohio	30.5	5.3	17
Oklahoma	33.0	5.9	18
Oregon	35.9	6.0	17
Pennsylvania	37.5	7.2	19
Rhode Island	54.8	6.4	12
South Carolina	24.7	3.8	15
South Dakota	49.5	11.4	23
Tennessee	26.3	4.9	18
Texas	24.4	4.1	17
Utah	41.8	7.7	18
Vermont	55.3	9.1	17
Virginia	27.4	4.6	17
Washington	27.8	4.5	16
West Virginia	32.3	4.9	15
Wisconsin	37.8	8.2	22
Wyoming	32.7	6.6	20

*Includes degrees in mathematics and agricultural, biological, physical, environmental, mathematical, and computer sciences. Health and social sciences are excluded.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Degrees in Science and Mathematics*, Tables 3-2, 4-3, 5-9, and 5-10; *Digest of Education Statistics, 1993,* Table 236. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

FINANCE INDICATORS

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Indicator 30: Current *public* expenditure on education as a percentage of GDP/GSP

Gross domestic product (GDP) is an aggregate measure of the value of goods and services produced in a country. Gross state product (GSP) is the analogous measure for U.S. states. The percentage of GDP/GSP spent on education from public sources corresponds to the share of a country's or a state's wealth that the *public* sector invests in education. Variations in this measure across countries and states may reflect differences in national and state priorities or preferences. This is not necessarily a measure of total investment in education, however, since in the United States and other countries, there are additional private expenditures for education.

- **In 1991, public expenditure for education at all levels comprised 4.6 percent of GDP in the United States. While this was lower than the percentage of GDP spent on public funding of all levels of education in Canada, it was the same as in France, and higher than in Italy, West Germany, and Japan, the other G-7 countries for which data were available.**

- **Four U.S. states — Montana, New Mexico, Vermont and West Virginia — and Canada devoted 6 percent or more of their gross products to public funding of education. Every U.S. state spent as much or more of its gross product for public funding of education at all levels than did Japan or West Germany.**

- **Public expenditure for education in the United States can be separated into 3.4 percent of GDP for primary through secondary education and 1.2 percent for higher education. Of six G-7 countries, only Canada spent larger percentages of its GDP on public funding of education at both levels, 4.0 and 2.1, respectively.**

- **Among the U.S. states, public primary through secondary spending ranged from 2.5 percent of gross state product in Delaware and Nevada to approximately 5 percent in Vermont and Montana. The range across countries was slightly narrower.**

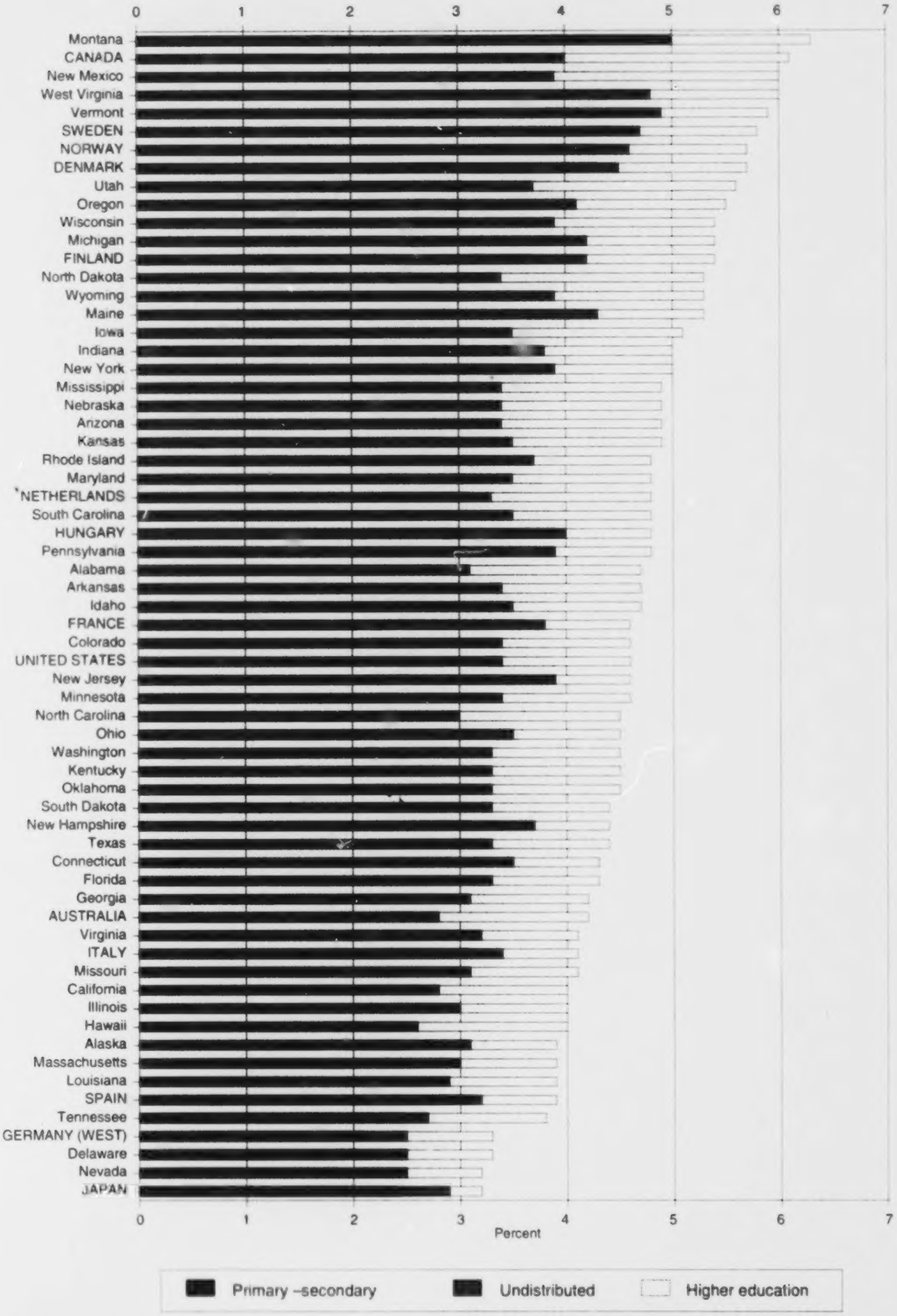
- **In 1991, the United States devoted the second highest percentage of GDP to public funding of higher education (1.2 percent) of the G-7 countries represented here. The percentage of GDP devoted to public funding of higher education in the G-7 countries ranged from 0.3 in Japan to 2.1 in Canada.**

Notes on interpretation:

This measure of public expenditure for education has the advantage that it does not require conversion of national currencies into dollars. However, it is not as useful for comparing countries that are vastly different in their stage of development or wealth per capita. Furthermore, fiscal effort measures, such as this one, convey little information about the absolute quantity of resources that a country devotes to each student's education. This measure can also be heavily influenced by the proportion of the population of school age and in school. Indicator 33 represents an attempt to control for this problem.

The percent "undistributed" represents that proportion of educational expenditure whose destination cannot be clearly identified as either primary through secondary or higher education. Administrative overhead at a national education ministry is sometimes classified as an undistributed expenditure, for example. Comparisons among countries on primary through secondary or on higher education expenditures can be made problematic by large undistributed proportions.

Figure 30: Current public expenditure on education as a percentage of GDP/GSP, by level of education, country, and state: 1991



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International *Indicators Project, 1993. U.S. Department of Education, National Center for Education Statistics, Digest of Education Statistics, 1993,* Tables 160, 338, and 339; Integrated Postsecondary Education Data System, Finance survey, 1990–91. U.S. General Accounting Office, *Education Finance, GAO/HEHS-95-3. U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business,* December 1993; Bureau of the Census, Statistical Abstract of the United States, 1992, Table 25.

Table 30a: Current public expenditure on education as a percentage of GDP, by level of education and country: 1991

Country	Total	Primary–secondary	Higher education	Undistributed
Australia	4.2	2.8	1.4	—
Canada[1]	6.1	4.0	2.1	—
Denmark	5.7	4.3	1.2	0.2
Finland	5.4	3.7	1.2	0.5
France	4.6	3.6	0.8	0.2
Germany (West)	3.3	2.1	0.8	0.4
Hungary	4.8	3.9	0.8	0.1
Italy[2]	4.1	3.1	0.7	0.3
Japan	3.1	2.4	0.3	0.5
Netherlands	4.8	3.1	1.5	0.2
Norway	5.7	4.3	1.1	0.3
Spain[3]	3.9	3.1	0.7	0.1
Sweden	5.7	4.7	1.1	—
United Kingdom	—	—	1.0	—
United States	4.6	3.4	1.2	—

— Not available or applicable.

[1] Preprimary expenditures are included in primary-secondary figure.

[2] 1989 data.

[3] 1992 data.

NOTE: Row percentages may not sum to totals, due to rounding. See supplemental note to Indicator 30 on pp. 236–242 for a detailed discussion of international comparisons of public education expenditures; on pp. 293–297 for details on data provided by all countries, Australia, Canada, Finland, France, West Germany, Hungary, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom, and the United States; for notes on the calculation of country- and state-level gross products, on the non-inclusion of proprietary schools, and the methodology used for adjusting inflation rates, and limitations to these adjustments.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993.

Table 30b: Current public expenditure on education as a percentage of GSP, by level of education and state: 1991

State	Total	Primary–secondary	Higher education
Alabama	4.7	3.1	1.6
Alaska	3.9	3.1	0.8
Arizona	4.9	3.4	1.5
Arkansas	4.7	3.4	1.3
California	4.0	2.8	1.2
Colorado	4.6	3.4	1.2
Connecticut	4.2	3.5	0.8
Delaware	3.3	2.5	0.8
District of Columbia	2.4	1.6	0.9
Florida	4.3	3.3	1.0
Georgia	4.2	3.1	1.1
Hawaii	4.1	2.6	1.4
Idaho	4.7	3.5	1.2
Illinois	4.0	3.0	1.0
Indiana	5.0	3.8	1.2
Iowa	5.1	3.5	1.6
Kansas	4.9	3.5	1.4
Kentucky	4.6	3.3	1.2
Louisiana	3.9	2.9	1.0
Maine	5.3	4.3	1.0
Maryland	4.8	3.5	1.3
Massachusetts	3.9	3.0	0.9
Michigan	5.4	4.2	1.2
Minnesota	4.6	3.4	1.2
Mississippi	4.9	3.4	1.5
Missouri	4.1	3.1	1.0
Montana	6.3	5.0	1.3
Nebraska	4.8	3.4	1.5
Nevada	3.3	2.5	0.7
New Hampshire	4.4	3.7	0.7
New Jersey	4.7	3.9	0.7
New Mexico	6.0	3.9	2.1
New York	5.0	3.9	1.1
North Carolina	4.5	3.0	1.5
North Dakota	5.3	3.4	1.9
Ohio	4.4	3.5	1.0
Oklahoma	4.6	3.3	1.2
Oregon	5.5	4.1	1.4
Pennsylvania	4.8	3.9	0.9
Rhode Island	4.8	3.7	1.1
South Carolina	4.8	3.5	1.3
South Dakota	4.4	3.3	1.1
Tennessee	3.9	2.7	1.1
Texas	4.4	3.3	1.1
Utah	5.6	3.7	1.9
Vermont	6.0	4.9	1.0
Virginia	4.1	3.2	0.9
Washington	4.5	3.3	1.2
West Virginia	6.0	4.8	1.2
Wisconsin	5.4	3.9	1.5
Wyoming	5.3	3.9	1.4

NOTE: Row percentages may not sum to totals, due to rounding. 1991 GSPs are estimated from 1990 data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Tables 160, 338, and 339; Integrated Postsecondary Education Data System, Finance Survey, 1990–91. U.S. General Accounting Office, *Education Finance,* GAO/HEHS-95-3. U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business,* December, 1993; Bureau of the Census, *Statistical Abstract of the United States, 1992,* Table 25.

Indicator 31: Current *public* expenditure on education as a percentage of total public expenditure

The percentage of total public expenditure that is devoted to education can be viewed as a rough indicator of the relative importance accorded to education among a nation's or state's public sector activities. It should be noted, however, that variations in the educational share of total public spending also reflect differences among nations and states in the division of responsibility for financing education or other activities between the public and private sectors. A high relative share on this measure may reflect generous public funding of education, restraint on the size of the public sector in areas other than education, or both. Conversely, a low relative share on this measure may reflect a large role for private financing in education, a large public sector in areas other than education, or some of both.

- **In 1991, the share of total public expenditure devoted to current education spending was 12.2 percent in the United States. This share was close to Canada's share (12.6 percent) and just below Finland's share (13.2 percent), the largest share among the 14 nations represented here. The U.S. share exceeded that of the remaining G-7 countries which had comparable data (Japan, France, Italy, and West Germany).**

- **Seven of the 13 countries represented here spent less than 10 percent of their total public expenditure on education; only 7 of the U.S. states had shares that low. Conversely, only 3 countries (including the United States) spent more than 12 percent of total public expenditure on education, whereas 27 states spent this much.**

- **The United States and Finland spent the highest share of total public expenditure on primary through secondary education (9.1 percent). Whereas only 3 out of 13 other nations spent at least 8 percent of total public expenditure on primary through secondary education, 43 U.S. states had shares that high.**

Notes on interpretation:

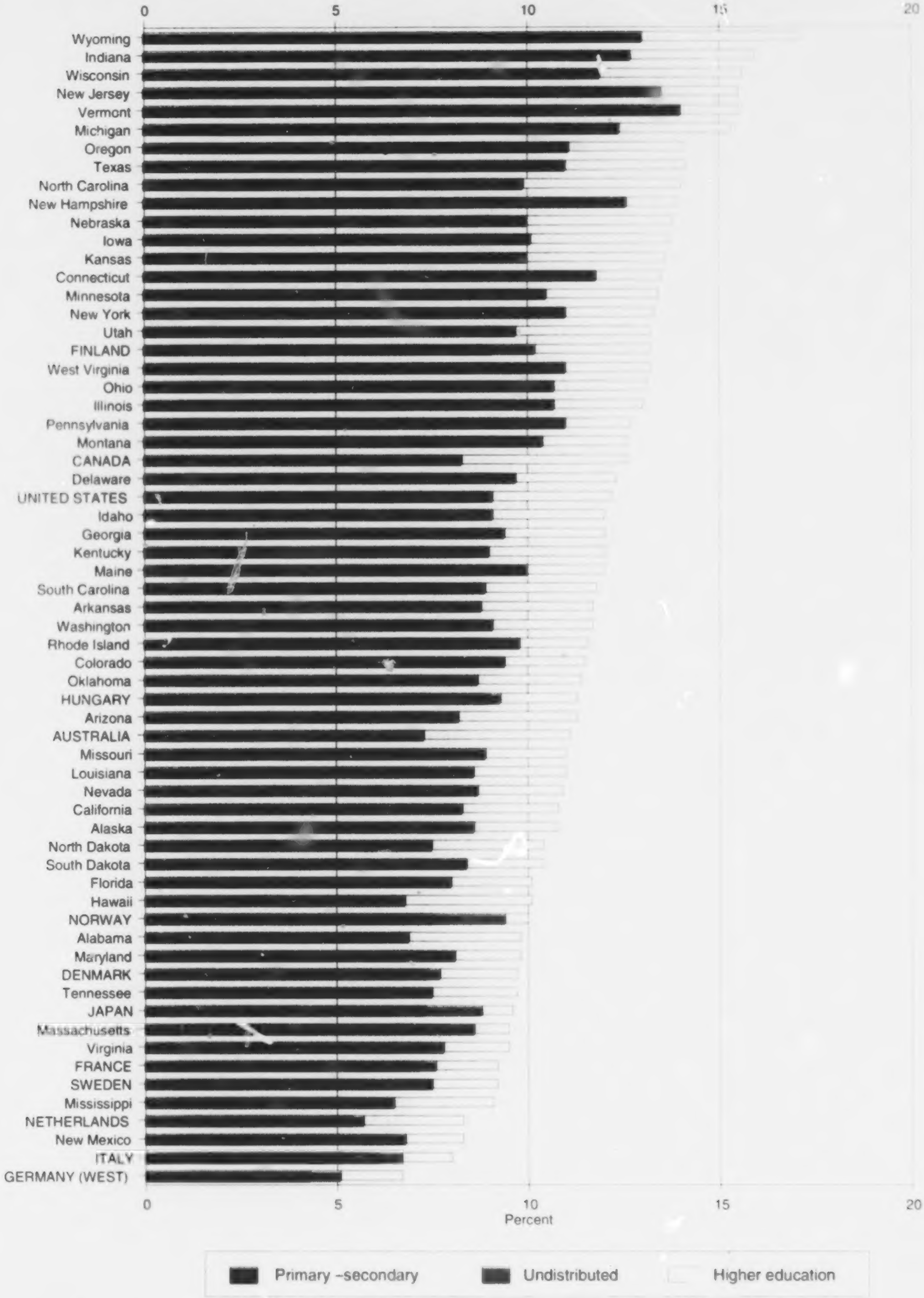
This measure of the share of public expenditure for education has the advantage that it does not require conversion of national currencies into U.S. dollars. However, fiscal effort measures, such as this one, convey little information about the absolute quantity of resources that a country devotes to each student's education. This measure can also be heavily influenced by the proportion of the population of school age and in school. Indicator 33 represents an attempt to control for this problem.

At the higher education level, countries or states that require students to pay school fees or to pay their own living expenses are likely to devote smaller percentages of public expenditure to higher education than countries that provide "free" higher education or subsidize student living expenses with public funds. In some countries, particularly the United States and Japan, a large portion of expenditure on higher education comes from private sources. See the supplemental note to Indicators 30-34 on pages 293-297 for data on private higher education expenditure in certain countries.

To some degree, one might expect education expenditure to comprise a larger proportion of a U.S. state's public expenditure than of a country's public expenditure. This is because national governments assume some expenditure burdens, such as those of national defense, diplomacy, and macroeconomic control, that state governments ordinarily do not.

Direct Federal government spending is not included in state expenditures. Only "own source" revenues or Federal government funds that flow through state governments are included for the U.S. states.

Figure 31: Current public expenditure on education as a percentage of total public expenditure, by level of education, country, and state: 1991



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Education, National Center for Education Statistics, Digest of Education Statistics, 1993, Tables *160, 338, and 339; Integrated Postsecondary Education Data System, Finance survey, 1990–91. U.S. General Accounting Office, Education* Finance, GAO/HEHS-95-3. Advisory Commission on Intergovernmental Relations, Significant Features of Fiscal Federalism, 1993, Volume 2, Table 68.

Table 31a: Current public expenditure on education as a percentage of total public expenditure, by level of education and country: 1991

Country	Total	Primary–secondary	Higher education	Undistributed/ other
Australia	11.1	7.4	3.8	—
Canada[1]	12.6	8.3	4.3	—
Denmark	9.7	7.4	2.0	0.3
Finland	13.2	9.1	3.0	1.1
France	9.2	7.2	1.6	0.4
Germany (West)	6.7	4.3	1.6	0.8
Hungary	11.3	9.0	2.0	0.3
Italy[2]	8.1	6.1	1.3	0.6
Japan	9.7	7.3	0.8	1.5
Netherlands	8.3	5.4	2.6	0.3
Norway	10.0	7.5	1.9	0.6
Sweden	9.3	7.5	1.7	—
United Kingdom	—	—	2.4	—
United States	12.2	9.1	3.1	—

— Not available or applicable.

[1] Preprimary expenditures are included in primary-secondary figure.

[2] 1989 data.

NOTE: Row percentages may not sum to totals, due to rounding. See supplemental notes to Indicator 31 on pp. 236–242 for a detailed discussion of international comparisons of current public education expenditures; on pp. 293–297 for details on data provided by all countries, Australia, Canada, Finland, France, West Germany, Hungary, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom, and the United States; for notes on the calculation of country- and state-level gross products, on the non-inclusion of proprietary schools, and the methodology used for adjusting inflation rates, and limitations to these adjustments.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993.

Table 31b: Current public expenditure on education as a percentage of total public expenditure, by level of education and state: 1991

State	Total	Primary-secondary	Higher education
Alabama	9.8	6.9	2.9
Alaska	10.8	8.6	2.2
Arizona	11.3	8.2	3.1
Arkansas	11.7	8.8	2.9
California	10.8	8.3	2.5
Colorado	11.5	9.4	2.1
Connecticut	13.5	11.8	1.7
Delaware	12.3	9.7	2.6
District of Columbia	17.6	15.2	2.4
Florida	10.0	8.0	2.1
Georgia	12.0	9.4	2.6
Hawaii	10.1	6.8	3.3
Idaho	12.1	9.1	2.9
Illinois	13.0	10.7	2.3
Indiana	15.9	12.7	3.2
Iowa	13.6	10.1	3.6
Kansas	13.6	10.0	3.6
Kentucky	12.1	9.0	3.0
Louisiana	11.0	8.6	2.4
Maine	12.1	10.0	2.0
Maryland	9.8	8.1	1.7
Massachusetts	9.4	8.6	0.9
Michigan	15.2	12.4	2.9
Minnesota	13.3	10.5	2.9
Mississippi	9.1	6.5	2.6
Missouri	10.9	8.9	2.1
Montana	12.6	10.4	2.2
Nebraska	13.8	10.0	3.8
Nevada	10.9	8.7	2.2
New Hampshire	13.9	12.6	1.3
New Jersey	15.5	13.5	2.0
New Mexico	8.3	6.8	1.5
New York	13.3	11.0	2.3
North Carolina	14.0	9.9	4.1
North Dakota	10.4	7.5	2.9
Ohio	13.0	10.7	2.4
Oklahoma	11.4	8.7	2.7
Oregon	14.1	11.1	3.0
Pennsylvania	12.7	11.0	1.7
Rhode Island	11.6	9.8	1.8
South Carolina	11.8	8.9	2.9
South Dakota	10.4	8.4	2.0
Tennessee	9.8	7.5	2.2
Texas	14.1	11.0	3.1
Utah	13.2	9.7	3.5
Vermont	15.5	14.0	1.5
Virginia	9.5	7.8	1.7
Washington	11.7	9.1	2.6
West Virginia	13.2	11.0	2.2
Wisconsin	15.7	11.9	3.7
Wyoming	17.2	13.0	4.1

NOTE: Row percentages may not sum to totals, due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Tables 160, 338 and 339; Integrated Postsecondary Education Data System, Finance Survey, 1990-91. U.S. General Accounting Office, *Education Finance,* GAO/HEHS-95-3. Advisory Commission on Intergovernmental Relations, *Significant Features of Fiscal Federalism, 1993,* Volume 2, Table 68.

Indicator 32: Current *public* expenditure per student

Current public expenditure per student is a measure of public investment adjusted for the number of students in the education system. It is the part of current education expenditure that is financed from public sources divided by the number of full-time-equivalent students enrolled in the education system, including those enrolled in private schools. It reflects the general purchasing power (or standard of living) given up (through public sources) to support the education of each student. Variations in per student expenditure result from differences in national and state spending priorities, the cost of local educational resources relative to other goods, the size of the corresponding private education sector, and the wealth of a country or state.

- **In 1991, current public expenditure per student at the primary through secondary level in the United States was $4,605, the highest of the 6 G-7 countries represented here. This was close to the $4,338 spent by Canada, but considerably more than the per-student expenditures at that level of education in the other G-7 countries — France, Italy, West Germany, and Japan — that had comparable data.**

- **The range of per-student public expenditure at the primary through secondary level across the U.S. states was wider than that across the countries represented here: from approximately $2,600 in Mississippi to over $7,900 in Alaska for the states; and from about $1,400 in Hungary to approximately $5,800 in Sweden for the countries.**

- **Current public expenditure per student at the higher education level in the United States was $6,767 in 1991. This was below the per-student public expenditure at the higher education level in Canada and the United Kingdom at $8,555 and $10,228, respectively, but higher than those in the other four G-7 countries.**

- **Per-student public expenditures in higher education among U.S. states ranged from slightly more than $3,600 in New Hampshire to nearly $13,000 in Alaska, more than 3 times higher. The range across the countries represented here extended about as wide, with Japan spending less than $2,400 per student and the United Kingdom spending more than $10,200 per student.**

Notes on interpretation:

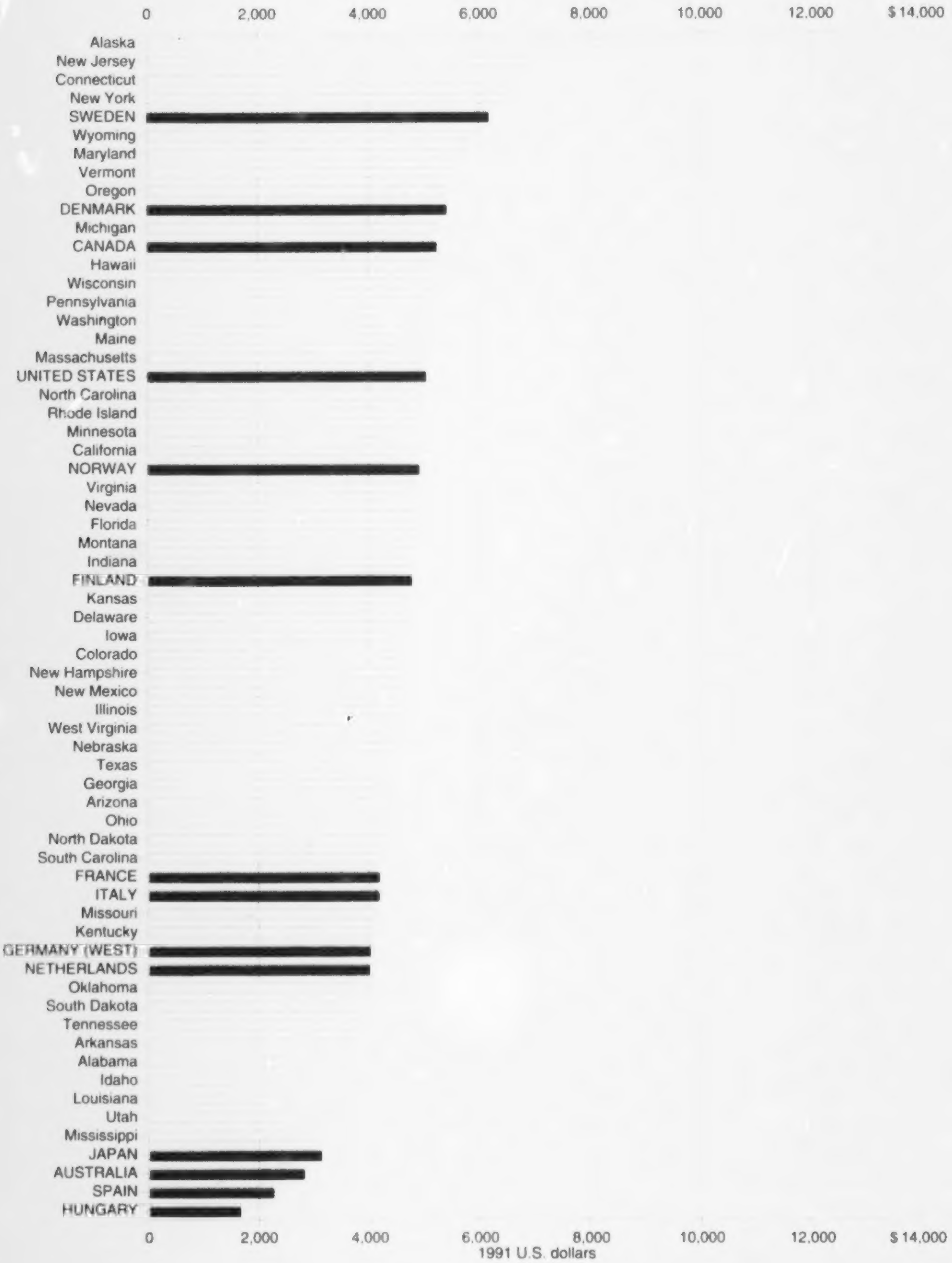
In some countries, particularly the United States and Japan, a large portion of expenditure on higher education comes from private sources, which are not included in this indicator. See the supplemental note to Indicator 32 on pages 293–297 for data on private higher education expenditure in certain countries.

This per-student expenditure measure excludes private spending but includes private-school students. It is calculated as current public expenditure for education divided by enrollment at both public and private schools. Thus, this is a measure of average public investment per student in the education system. It is not a measure of the total resources a student receives, which would include private expenditure.

Whereas a purchasing-power parity index is used to adjust expenditure figures across countries for variations in the cost-of living, no such adjustment is made across states.

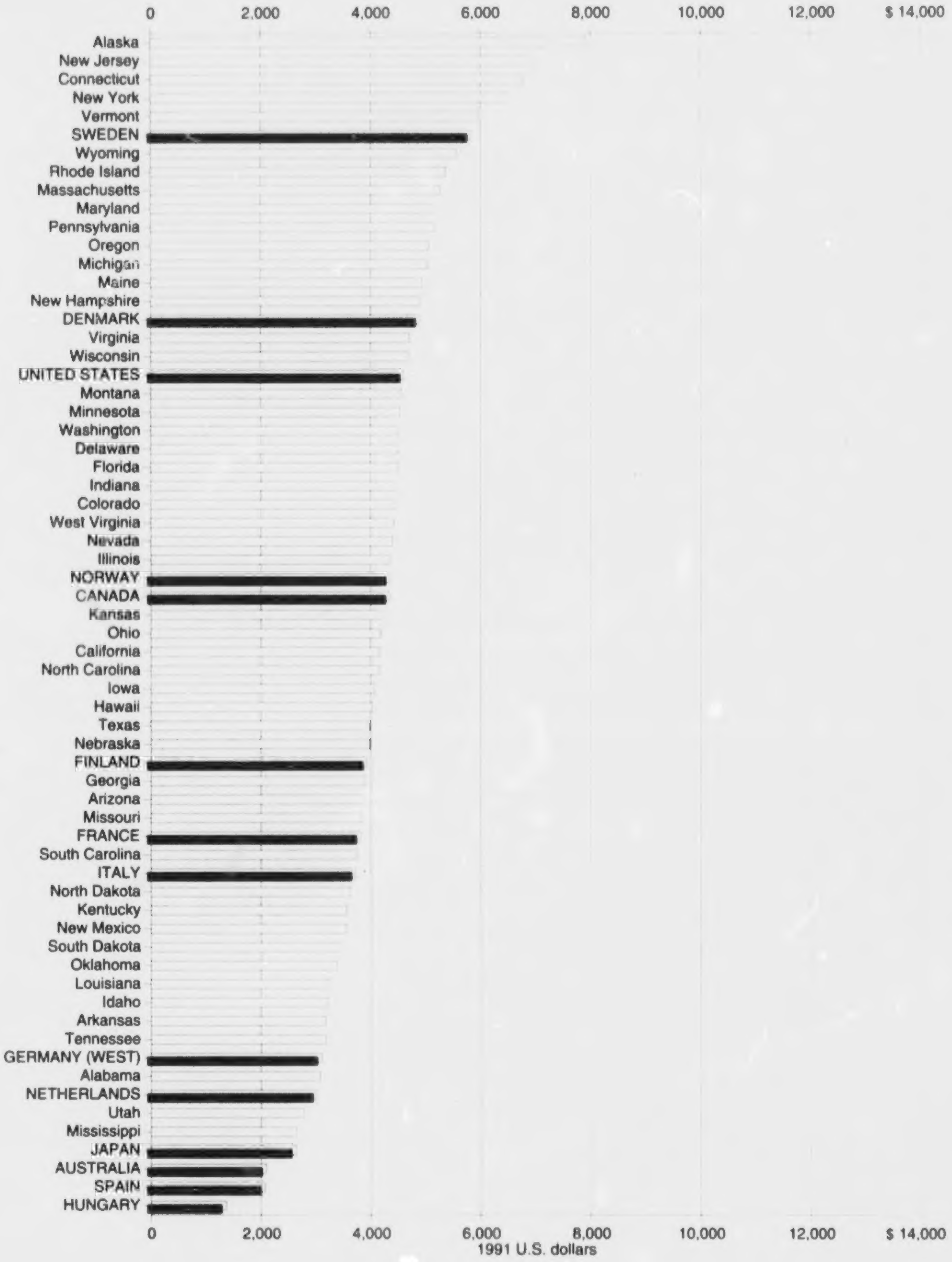
The higher education expenditure figure subsumes both non-university and university higher education. In effect, it is a weighted average of current public expenditure for the two types of higher education.

Figure 32a: Current public expenditure per student on primary through higher education (in U.S. dollars), by country and state: 1991



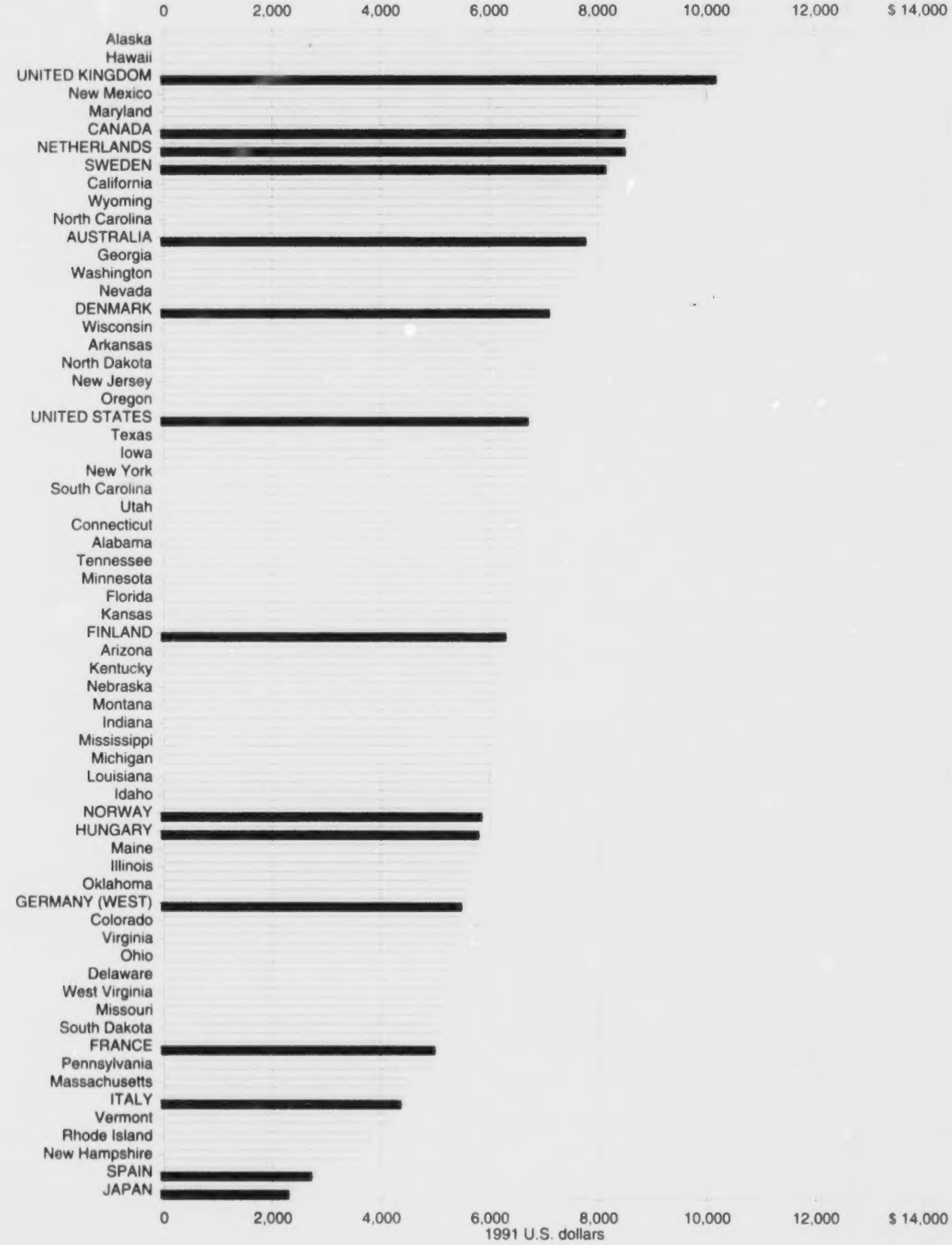
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, Tables 45, 160, 197, 338, and 339; *Digest of Education Statistics, 1994*, Table 63; Integrated Postsecondary Education Data System, Finance survey, 1990–91. U.S. General Accounting Office, *Education Finance*, GAO/HEHS-95-3.

Figure 32b: **Current public expenditure per student on primary through secondary education (in U.S. dollars), by country and state: 1991**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Tables 45, 160, 197, 338, and 339; *Digest of Education Statistics, 1994,* Table 63. U.S. General Accounting Office, *Education Finance,* GAO/HEHS-95

Figure 32c: **Current public expenditure per student on higher education (in U.S. dollars), by country and state: 1991**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Tables 197, 338, and 339; Integrated Postsecondary Education Data System, Finance survey, 1990–91.

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Table 32a: Current public expenditure per student (in U.S. dollars), by level of education and country: 1991

Country	All levels	Primary-secondary	Higher education
Australia	$2,783	$2,093	$7,830
Canada[1]	5,211	4,338	8,555
Denmark	5,395	4,884	7,160
Finland	4,748	3,928	6,357
France[1]	4,153	3,808	5,048
Germany (West)	3,979	3,101	5,539
Hungary	1,626	1,363	5,855
Italy[2]	4,145	3,720	4,421
Japan	3,092	2,635	2,362
Netherlands	3,970	3,018	8,552
Norway	4,887	4,343	5,917
Spain[3]	2,233	2,077	2,778
Sweden	6,159	5,825	8,204
United Kingdom	—	—	10,228
United States	5,015	4,605	6,767

— Not available.

[1] Preprimary expenditures and enrollments are included in the primary-secondary figure.

[2] 1989 data.

[3] 1992 data.

NOTE: Purchasing power parity indices (PPPI) were used to convert other currencies to U.S. dollars. Because the fiscal year has a different starting date in different countries, within-country Consumer Price Indices (CPI) were used to adjust the PPPIs to account for inflation. See supplemental notes to Indicator 32 on pp. 236-242 for a detailed discussion of international comparisons of public education expenditures; on pp. 293-297 for details on data provided by all countries, Australia, Canada, Finland, France, West Germany, Hungary, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom, and the United States; for notes on the non-inclusion of proprietary schools, on the calculation of full-time equivalent enrollments, on the methodology used for adjusting inflation rates, and limitations to these adjustments.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993.

Table 32b: Current public expenditure per student, by level of education and state: 1991

State	All levels	Primary-secondary	Higher education
Alabama	$3,727	$3,071	$6,525
Alaska	8,619	7,920	12,726
Arizona	4,380	3,870	6,296
Arkansas	3,735	3,174	6,965
California	4,893	4,157	8,193
Colorado	4,650	4,432	5,454
Connecticut	6,720	6,759	6,555
Delaware	4,662	4,508	5,224
District of Columbia	5,919	6,460	5,145
Florida	4,823	4,505	6,402
Georgia	4,442	3,887	7,689
Hawaii	5,170	4,022	10,642
Idaho	3,651	3,204	5,956
Illinois	4,600	4,346	5,612
Indiana	4,750	4,448	6,098
Iowa	4,651	4,071	6,727
Kansas	4,673	4,208	6,384
Kentucky	4,031	3,564	6,254
Louisiana	3,647	3,225	5,995
Maine	5,084	4,934	5,841
Maryland	5,812	5,156	8,765
Massachusetts	5,045	5,256	4,463
Michigan	5,235	5,047	6,023
Minnesota	4,910	4,538	6,441
Mississippi	3,205	2,648	6,030
Missouri	4,092	3,844	5,125
Montana	4,821	4,553	6,179
Nebraska	4,473	3,985	6,232
Nevada	4,828	4,401	7,279
New Hampshire	4,638	4,888	3,624
New Jersey	6,950	6,963	6,876
New Mexico	4,618	3,563	9,988
New York	6,532	6,494	6,671
North Carolina	4,950	4,154	8,115
North Dakota	4,351	3,623	6,905
Ohio	4,368	4,178	5,230
Oklahoma	3,795	3,390	5,595
Oregon	5,406	5,055	6,781
Pennsylvania	5,114	5,153	4,950
Rhode Island	4,916	5,361	3,803
South Carolina	4,231	3,740	6,666
South Dakota	3,751	3,457	5,101
Tennessee	3,740	3,174	6,479
Texas	4,443	3,986	6,761
Utah	3,473	2,781	6,603
Vermont	5,545	5,957	4,182
Virginia	4,851	4,708	5,424
Washington	5,086	4,511	7,644
West Virginia	4,556	4,420	5,188
Wisconsin	5,170	4,687	6,999
Wyoming	6,049	5,561	8,124

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Tables 45, 160, 197, 338, and 339; *Digest of Education Statistics, 1994,* Table 63; Integrated Postsecondary Education Data System, Finance Survey, 1990-91. U.S. General Accounting Office, *Education Finance,* GAO/HEHS-95-3.

Indicator 33: Current *public* expenditure per student as a percentage of GDP/GSP per capita

This indicator adjusts public per-student expenditure by the income of a country or state, as measured by gross domestic product (GDP) or gross state product (GSP), respectively. It allows for instructive comparisons among countries or states with wide differences in gross products by examining what each country or state spends on its students relative to its available resources. For example, a less wealthy country or state with a per-student expenditure equal to that of another may actually devote a larger share of its available resources to education. In such a case, the less wealthy country or state could be making a greater "fiscal effort" than the other.

- **In 1991 at the primary – secondary level, per-student public spending in the United States was approximately 20 percent of GDP per capita. Among the G–7 countries, Canada, Italy, and France had larger proportions. Italy, which had the lowest GDP per capita, and thus the fewest resources from which to draw of the G–7 countries (see Indicator 4), had the second highest percentage (22.0).**

- **The U.S. states displayed a fairly wide range of per-student expenditure at the primary through secondary level as a percentage of their per-capita gross products, from close to 15 percent in Louisiana and Delaware to 28 percent or more in Vermont and West Virginia. However, the range across the countries represented here extended even wider. Australia and Japan spent less per student for primary through secondary education as a percentage of their per-capita gross products than did Louisiana. Conversely, Sweden spent more per student as a percentage of its per capita gross product than did Vermont.**

- **In the United States in 1991, current public expenditure per student at the higher education level as a percentage of per capita GDP was about 30 percent. Percentages in the states ranged from 16.8 in New Hampshire to 56.7 in New Mexico. The U.S. percentage was lower than those for Canada and the United Kingdom, but higher than those for the other G–7 countries — West Germany, France, Italy, and Japan.**

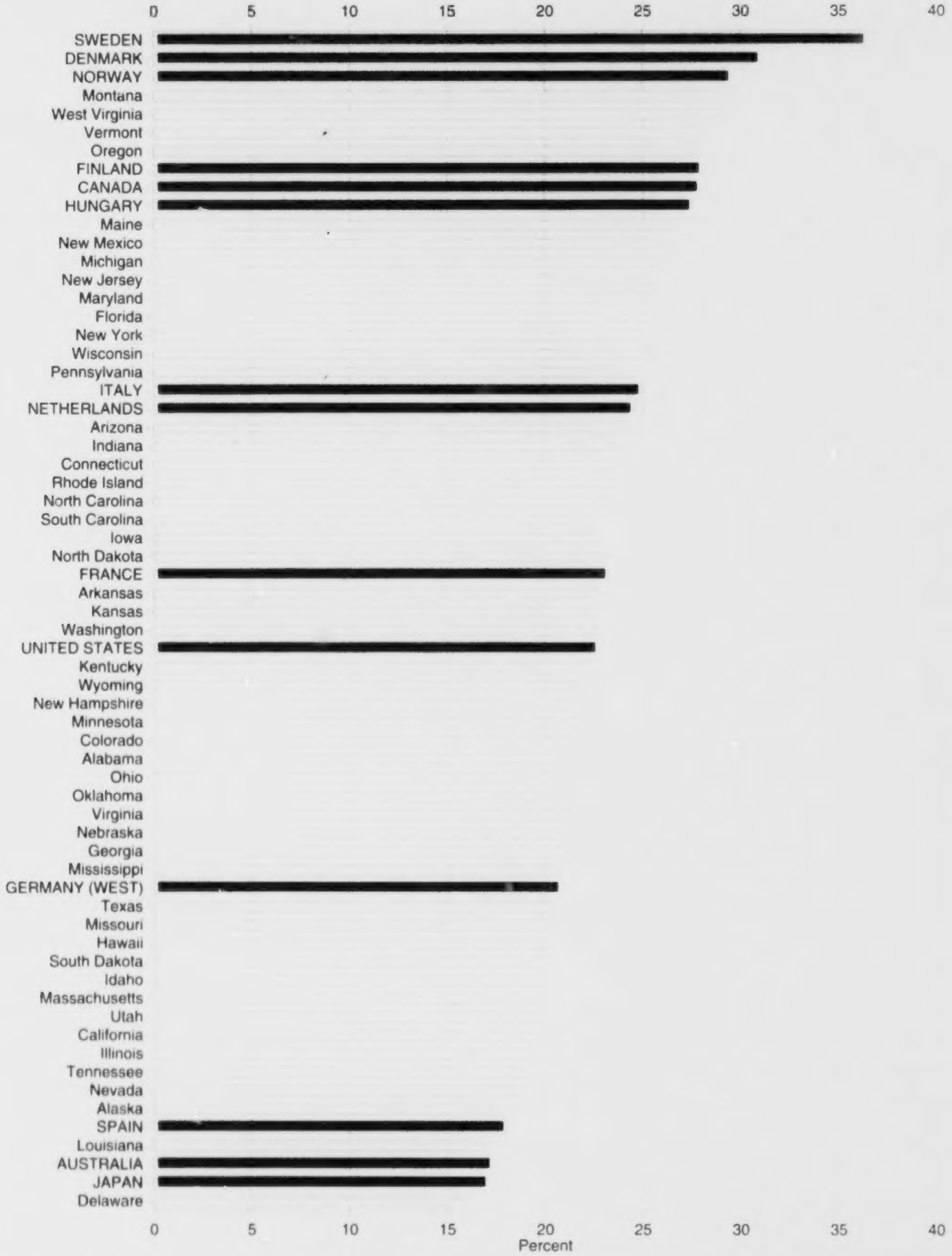
Notes on interpretation:

Both Indicators 30 and 33 are measures of "fiscal effort" because they relate public expenditure to country or state wealth. Indicator 33 attempts to control for the proportion of the population that is of school age and enrolled in school. It is, thus, somewhat less volatile, and more consistent, than Indicator 30 in the face of varying proportions of school-aged populations to the general population. Countries or states with relatively high birth rates, for example, would likely rank relatively higher on Indicator 30 than on this indicator, other factors held equal.

This indicator does not, however, control for *access* to school. Some countries or states may have relatively high dropout rates due to an insufficient supply of school places given the demand, cultural norms that keep would-be students (especially females) at home, or the demands of poverty that force young people to begin work at an early age. Considering just this aspect of access to education, Indicator 30, which does not control for the number of enrolled students (and, thus, does not exclude dropouts from its calculation), is the less volatile, and more consistent, measure of fiscal effort.

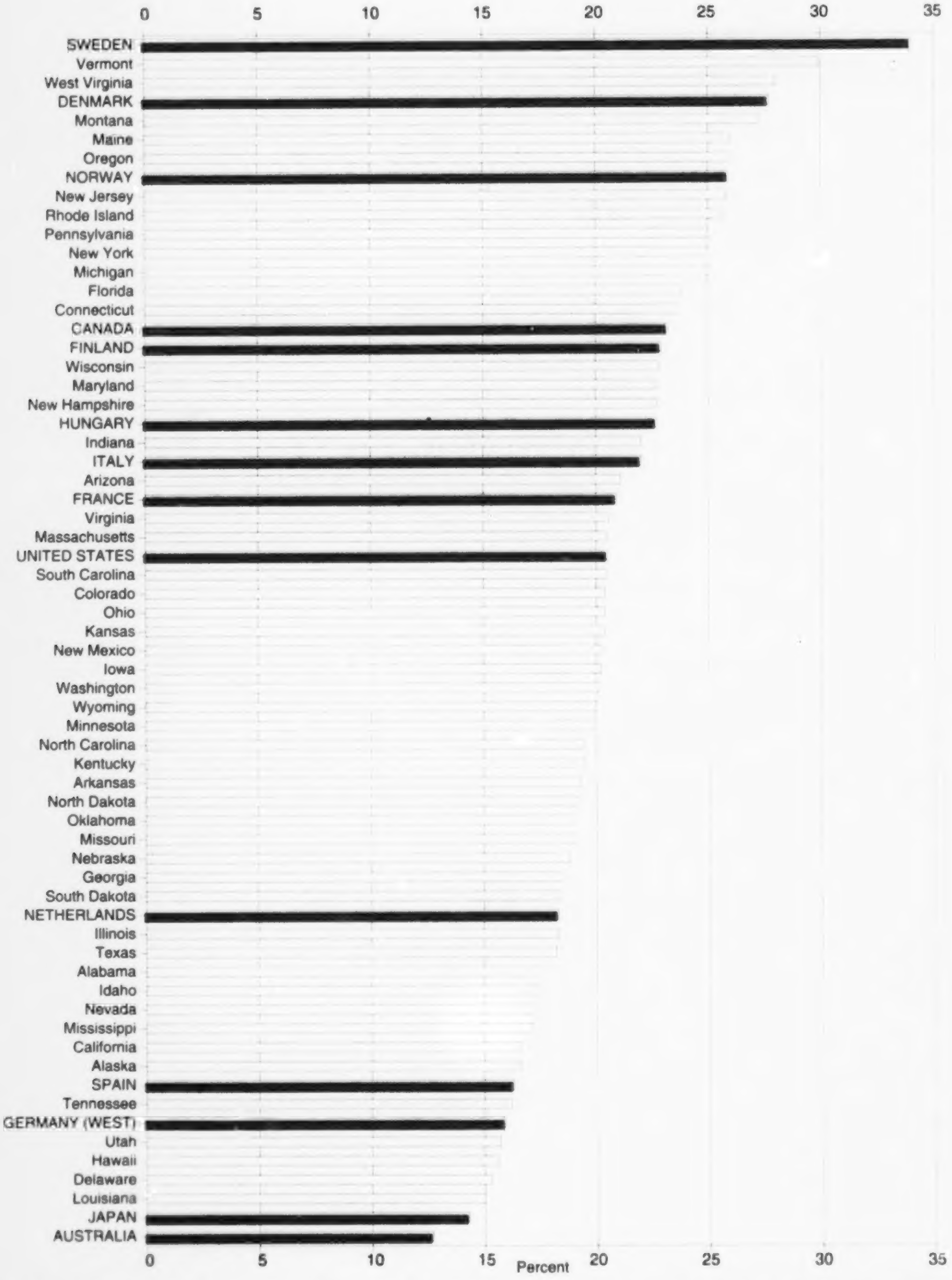
In some countries, particularly the United States and Japan, a large portion of expenditure on higher education comes from private sources, which are not included in this indicator. See the supplemental note to Indicator 33 on pages 293–297 for data on private higher education expenditure in certain countries.

Figure 33a: **Current public expenditure per student for primary through higher education as a percentage of GDP/GSP per capita, by country and state: 1991**



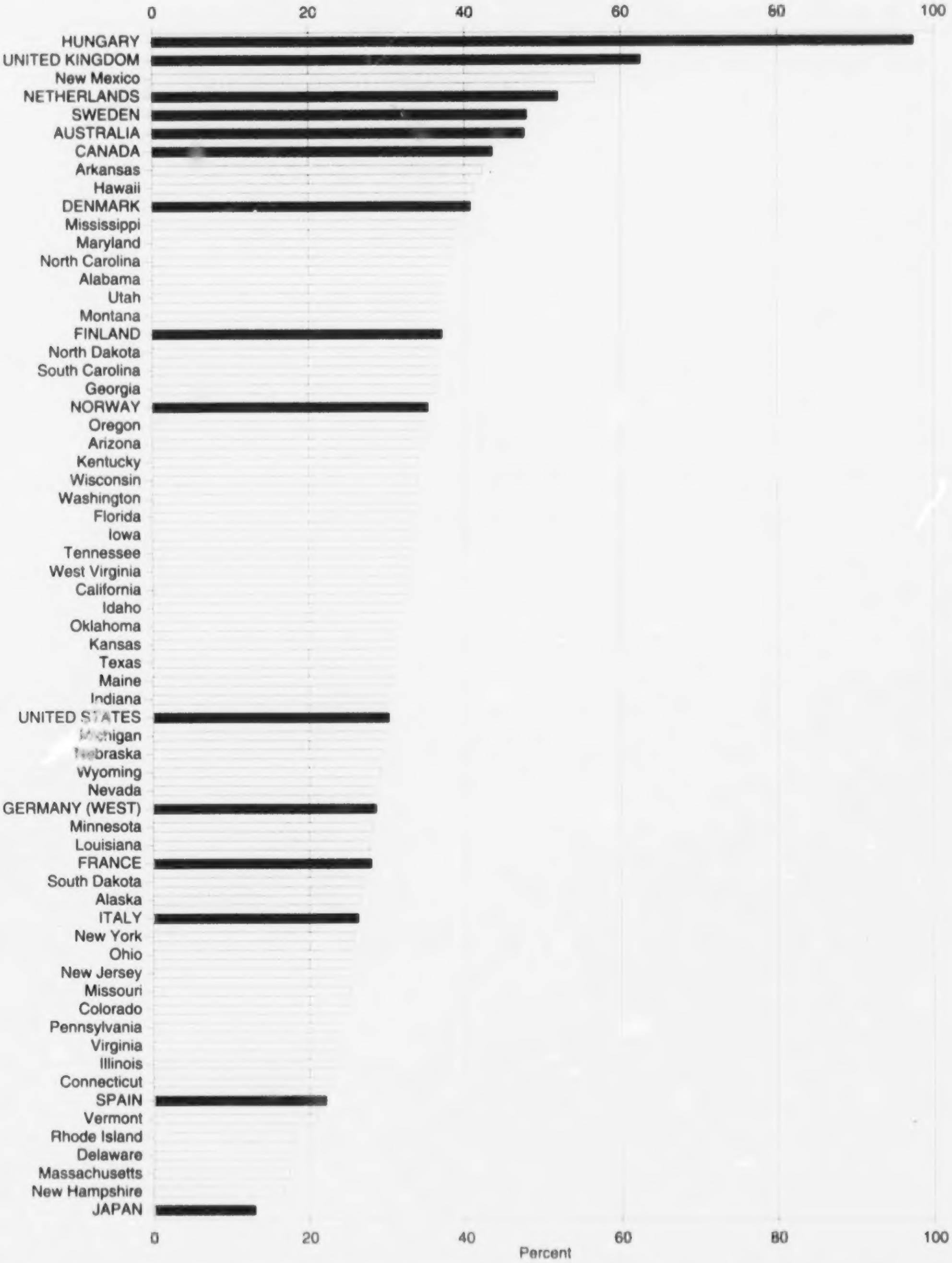
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, Tables 45, 160, 197, 338, and 339; *Digest of Education Statistics, 1994*, Table 63; Integrated Postsecondary Education Data System, Finance survey, 1990–91; U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, December 1993; Bureau of the Census, *Statistical Abstract of the United States, 1992*, Table 25. U.S. General Accounting Office, *Education Finace*.

Figure 33b: **Current public expenditure per student for primary through secondary education as a percentage of GDP/GSP per capita, by country and state: 1991**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, Tables 45, and 160; *Digest of Education Statistics, 1994*, Table 63. U.S. General Accounting Office, *Education Finance*, GAO/HEHS-95-3. U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, December 1993; Bureau of the Census, *Statistical Abstract of the United States, 1992*, Table 25.

Figure 33c: **Current public expenditure per student for higher education as a percentage of GDP/GSP per capita, by country and state: 1991**



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, Tables 197, 338, and 339; Integrated Postsecondary Education Data System, Finance survey, 1990–91. U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, December 1993; Bureau of the Census, *Statistical Abstract of the United States, 1992*, Table 25.

Table 33a: Current public expenditure per student as a percentage of GDP per capita, by level of education and country: 1991

Country	All levels	Primary–secondary	Higher education
Australia	16.9	12.7	47.6
Canada[1]	27.5	23.2	43.5
Denmark	30.6	27.7	40.7
Finland	27.6	22.9	37.0
France	22.8	20.9	27.8
Germany (West)	20.4	15.9	28.4
Hungary	27.1	22.7	97.4
Italy[2]	24.5	22.0	26.1
Japan	16.7	14.3	12.8
Netherlands	24.1	18.3	51.9
Norway	29.1	25.9	35.2
Spain[3]	17.6	16.3	21.9
Sweden	36.0	34.0	47.9
United Kingdom	—	—	62.5
United States	22.3	20.5	30.1

— Not available.

[1] Preprimary expenditures are included in primary-secondary figure.

[2] 1989 data.

[3] 1992 data.

NOTE: Row percentages may not sum to totals, due to rounding. See supplemental note to Indicator 33 on pp. 236–242 for a detailed discussion of international comparisons of public education expenditures; on pp. 293–297 for details on data provided by all countries, Australia, Canada, Finland, France, West Germany, Hungary, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom, and the United States; for notes on the calculation of country- and state-level gross products, the non-inclusion of proprietary schools, the calculation of full-time equivalent enrollments, the methodology used for adjusting inflation rates, and limitations to these adjustments.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993.

Table 33b: Current public expenditure per student relative to GSP per capita, by level of education and state: 1991

State	All levels	Primary-secondary	Higher education
Alabama	21.4	17.6	37.5
Alaska	18.0	16.6	26.6
Arizona	23.9	21.1	34.3
Arkansas	22.7	19.3	42.3
California	19.6	16.6	32.7
Colorado	21.4	20.4	25.1
Connecticut	23.5	23.7	22.9
Delaware	15.8	15.3	17.7
District of Columbia	9.9	10.8	8.6
Florida	25.5	23.8	33.9
Georgia	21.0	18.4	36.4
Hawaii	20.0	15.6	41.2
Idaho	19.8	17.4	32.3
Illinois	19.3	18.3	23.6
Indiana	23.5	22.0	30.2
Iowa	23.0	20.2	33.3
Kansas	22.7	20.4	31.0
Kentucky	22.0	19.5	34.1
Louisiana	16.9	15.0	27.8
Maine	26.8	26.0	30.8
Maryland	25.6	22.7	38.6
Massachusetts	19.7	20.5	17.4
Michigan	25.9	25.0	29.8
Minnesota	21.5	19.9	28.2
Mississippi	20.7	17.1	39.0
Missouri	20.2	19.0	25.3
Montana	28.9	27.3	37.0
Nebraska	21.2	18.8	29.5
Nevada	18.9	17.2	28.5
New Hampshire	21.5	22.7	16.8
New Jersey	25.8	25.8	25.5
New Mexico	26.2	20.2	56.7
New York	25.2	25.0	25.7
North Carolina	23.2	19.5	38.1
North Dakota	23.0	19.2	36.5
Ohio	21.3	20.4	25.5
Oklahoma	21.3	19.0	31.4
Oregon	27.7	25.9	34.8
Pennsylvania	24.8	25.0	24.0
Rhode Island	23.5	25.6	18.2
South Carolina	23.1	20.5	36.5
South Dakota	20.0	18.4	27.1
Tennessee	19.1	16.2	33.1
Texas	20.3	18.2	30.9
Utah	19.6	15.7	37.2
Vermont	27.8	29.9	21.0
Virginia	21.2	20.6	23.7
Washington	22.6	20.1	34.0
West Virginia	28.9	28.0	32.9
Wisconsin	25.1	22.8	34.0
Wyoming	21.8	20.0	29.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Tables 45, 160, 197, 338, and 339; *Digest of Education Statistics, 1994;* Table 63; Integrated Postsecondary Education Data System, Finance Survey, 1990-91. U.S. General Accounting Office, *Education Finance,* GAO/HEHS-95-3. U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business,* December 1993; Bureau of the Census, *Statistical Abstract of the United States, 1992,* Table 25.

Indicator 34: Distribution of current *public* expenditure on education

The distribution of current public expenditure between the primary through secondary level and the higher education level reflects national education goals and strategies regarding the priority given to each education level. It is also influenced by the number of students enrolled at each level and by the age distribution of the population. It is important to note that this indicator does not give a complete picture of the distribution of public resources between the two levels, since some countries did not classify the distribution of portions of their expenditure, reporting them, instead, as "undistributed."

- **Among the six G-7 countries with comparative data for 1991, Japan, France, and Italy allocated a higher percentage of their current public education expenditure at the primary through secondary level than did the United States, which distributed 74.4 percent to that level of education. Canada and West Germany spent a lower percentage than did the United States at the primary through secondary level.**

- **The proportion of current public education spending allocated to higher education in the United States was just above 25 percent. Among the six G-7 countries included here, Canada had a higher proportion — 34 percent — and so, perhaps, did West Germany, if their "undistributed" expenditures were allocated across levels.**

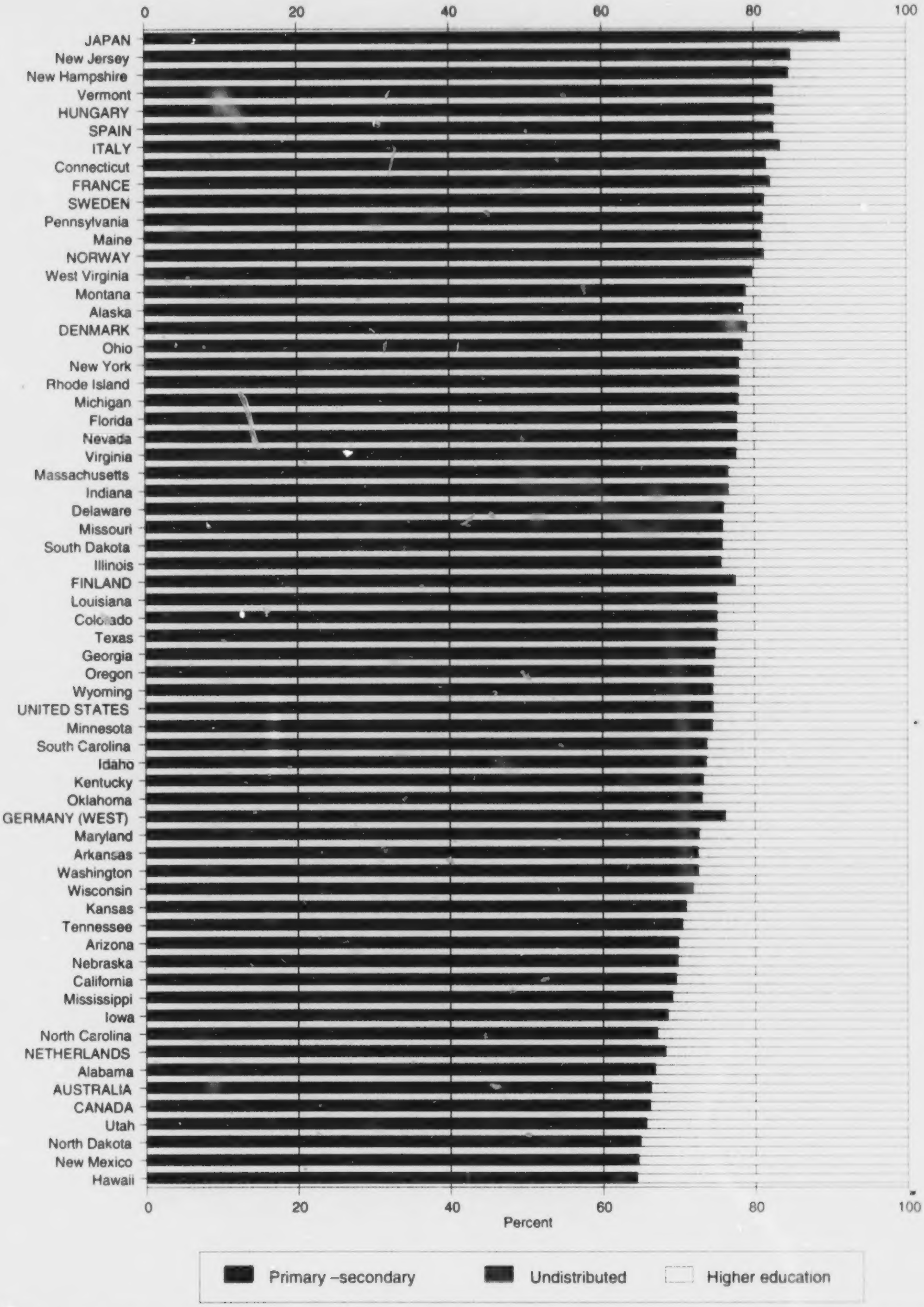
- **Whereas the higher education proportion of public education spending for as many as 7 of the other 13 countries represented here was below 20 percent, only 6 of the U.S. states had proportions that low. Conversely, whereas 11 U.S. states allocated 30 percent or more of current public education spending to higher education, only 3 countries — the Netherlands, Australia, and Canada — allocated proportions that high.**

Notes on interpretation:

The duration, the number of years of school comprised by a school level, can vary from country to country and from state to state. Some countries, for example, have an extra year or two of secondary school for some of their students. The longer the duration of a school level, the larger a share of educational expenditure one would expect at that level.

This indicator should not be interpreted as a measure of the resources devoted to education, but rather as an indicator of the distribution of those resources between education levels.

Figure 34: Distribution of current public expenditure on education, by level of education, country, and state: 1991



NOTE: States and Nations are sorted from high to low according to the primary-secondary proportion of expenditure. "Undistributed" expenditures are allocated across the levels of education according to their proportions.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. U.S. Department of Education, National Center for Education Statistics, Digest of Education Statistics, 1993, Tables *160, 338, and 339; Integrated Postsecondary Education Data System, Finance survey, 1990-91. U.S. General Accounting Office, Education* Finance, GAO/HEHS-95-3.

Table 34a: Distribution of current public expenditure on education, by level of education and country: 1991

Country	Percent of current public education expenditure		
	Primary–secondary	Higher education	Undistributed/ other
Australia	66.2	33.8	—
Canada[1]	66.0	34.0	—
Denmark	76.3	20.9	2.8
Finland	68.8	22.6	8.6
France	78.2	17.9	3.9
Germany (West)	64.5	24.0	11.5
Hungary	79.8	17.4	2.8
Italy[2]	75.8	16.6	7.6
Japan	75.5	8.7	15.8
Netherlands	64.8	31.9	3.3
Norway	75.1	18.7	6.2
Spain[3]	79.9	17.5	2.6
Sweden	81.3	18.7	—
United States	74.4	25.6	—

— Not available or applicable.

[1] Preprimary expenditures are included in primary-secondary figure.

[2] 1989 data.

[3] 1992 data.

NOTE: Row percentages may not sum to 100 due to rounding. See supplemental notes to indicator 34 on pp. 236–242 for a detailed discussion of international comparisons of public education expenditures; and on pp. 297–298 for details on data provided by Australia, Canada, France, West Germany, Hungary, the Netherlands, Spain, and the United Kingdom, for a discussion of the non-inclusion of proprietary schools, and the methodology used for adjusting inflation rates.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993.

Table 34b: Distribution of current public expenditure on education, by level of education and state: 1991

State	Percent of current public education expenditure Primary–secondary	 Higher education
Alabama	66.7	33.3
Alaska	78.5	21.5
Arizona	69.8	30.2
Arkansas	72.4	27.6
California	69.5	30.5
Colorado	75.0	25.0
Connecticut	81.5	18.5
Delaware	75.9	24.1
District of Columbia	64.3	35.7
Florida	77.7	22.3
Georgia	74.7	25.3
Hawaii	64.3	35.7
Idaho	73.5	26.5
Illinois	75.5	24.5
Indiana	76.5	23.5
Iowa	68.4	31.6
Kansas	70.8	29.2
Kentucky	73.1	26.9
Louisiana	75.0	25.0
Maine	80.9	19.1
Maryland	72.6	27.4
Massachusetts	76.5	23.5
Michigan	77.8	22.2
Minnesota	74.4	25.6
Mississippi	69.0	31.0
Missouri	75.7	24.3
Montana	78.8	21.2
Nebraska	69.7	30.3
Nevada	77.7	22.3
New Hampshire	84.5	15.5
New Jersey	84.8	15.2
New Mexico	64.5	35.5
New York	77.9	22.1
North Carolina	67.0	33.0
North Dakota	64.8	35.2
Ohio	78.4	21.6
Oklahoma	72.9	27.1
Oregon	74.5	25.5
Pennsylvania	81.1	18.9
Rhode Island	77.9	22.1
South Carolina	73.6	26.4
South Dakota	75.7	24.3
Tennessee	70.3	29.7
Texas	74.9	25.1
Utah	65.6	34.4
Vermont	82.5	17.5
Virginia	77.6	22.4
Washington	72.4	27.6
West Virginia	79.7	20.3
Wisconsin	71.7	28.3
Wyoming	74.4	25.6

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Tables 160, 338, and 339; *Integrated Postsecondary Education Data System*, Finance Survey, 1990-91. U.S. General Accounting Office, *Education Finance,* GAO/HEHS-95-3.

Indicator 35: Teacher salaries

Teacher salaries are an important indicator of the level of investment in a nation's or state's education system. Without exception across nations and states, teacher salaries constitute the greatest portion of education expenditure. The amount of money paid to teachers is a primary factor in attracting and retaining the most desirable candidates for teaching positions. This indicator presents data on average teacher salaries for the U.S. and its states and, in other countries, for *secondary school* teachers with approximately 15 years of experience (as listed on union or government salary schedules), about the average number of years of experience among U.S. teachers. Annual teacher salaries are also adjusted here in two ways: by dividing them by the country or state gross product per capita, and by the average number of school days per year. The first adjustment allows for comparisons in teacher salaries across nations and states relative to the wealth from which each nation and state can draw. The second adjustment allows for comparisons in annual teacher salaries across nations and states given the number of school days.

- **The average teacher salary in the United States for the school year 1991–1992 was about $34,000. That was the median among the G–7 countries for mid-career secondary school teachers. Salaries for mid-career teachers in West Germany, France, and Canada were higher (over $39,000 in France and West Germany); while salaries for mid-career teachers in Japan, England and Scotland, and Italy were lower (less than $22,000 in Italy) than that for the United States.**

- **The range of salaries for mid-career secondary school teachers across countries was slightly wider than the average teacher salary range across states. Teachers in the state with the highest salaries, Connecticut, received twice the average salary of their counterparts in South Dakota ($47,510 and $23,291, respectively). Teachers in Switzerland, the country with the highest-paid teachers, received almost two-and-a-half times the salary of Italian teachers ($52,358 and $21,566, respectively).**

- **Fourteen of the 18 other countries had ratios of secondary school teacher salaries to GDP per capita of 1.75 or higher. Only 4 U.S. states had ratios that high.**

- **When annual salaries for 1992 were divided by the actual number of school days per year, the U.S. average teacher salary per school day ($191) was just below Canada's ($194) and just above West Germany's ($181). The average teacher salaries per school day in other large countries were lower — $170 in England and Scotland, $147 in Japan, and $106 in Italy.**

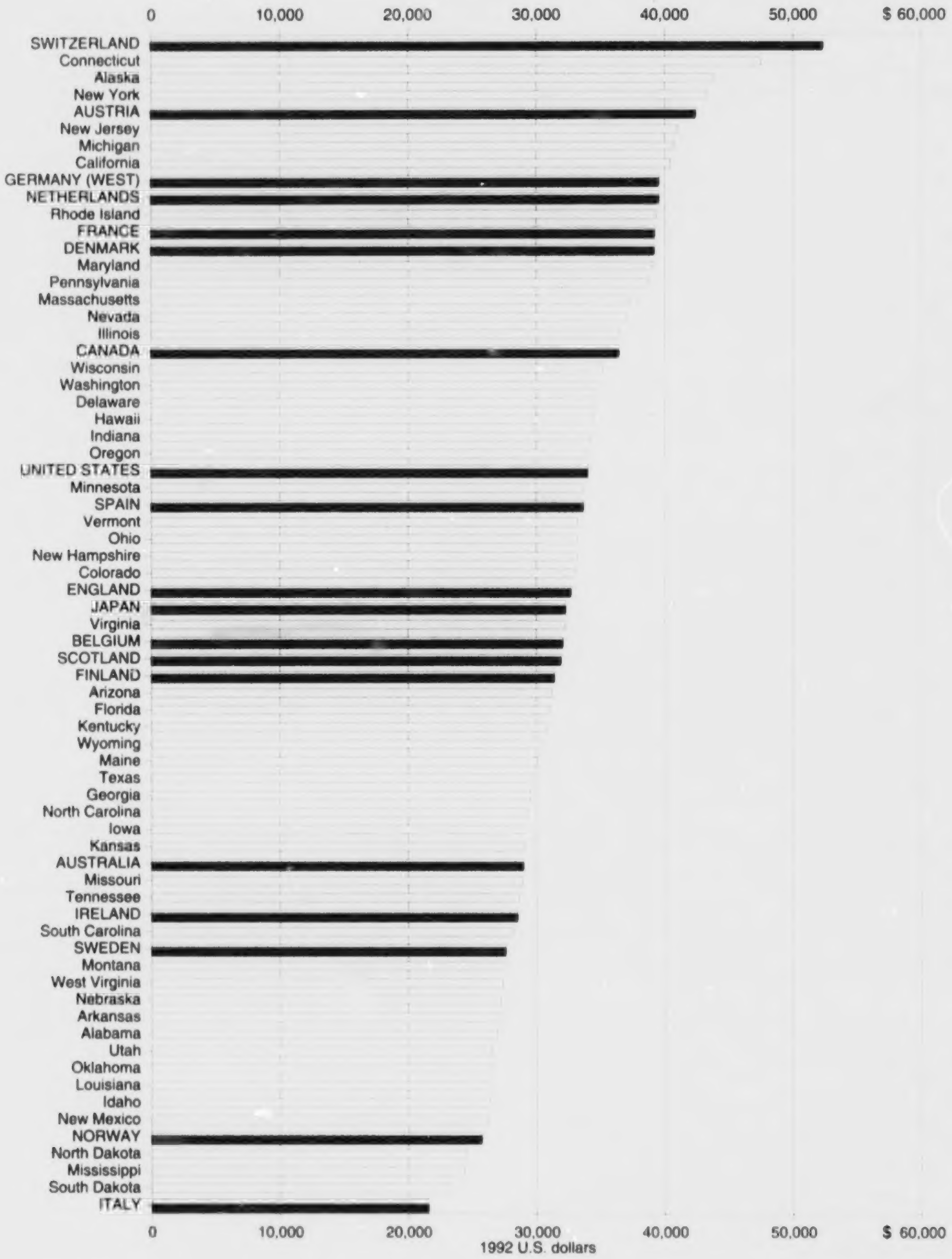
Notes on interpretation:

It is difficult to adjust salaries across nations and states to account for all the various conditions that contribute to the *quality* of the work. The teacher salaries presented here are not adjusted for varying working conditions, such as class size, or for teacher training.

Unlike in most other countries, there is little difference in salary levels between U.S. elementary and secondary school teachers. In some countries, the difference can be quite large, with secondary school teachers paid more.

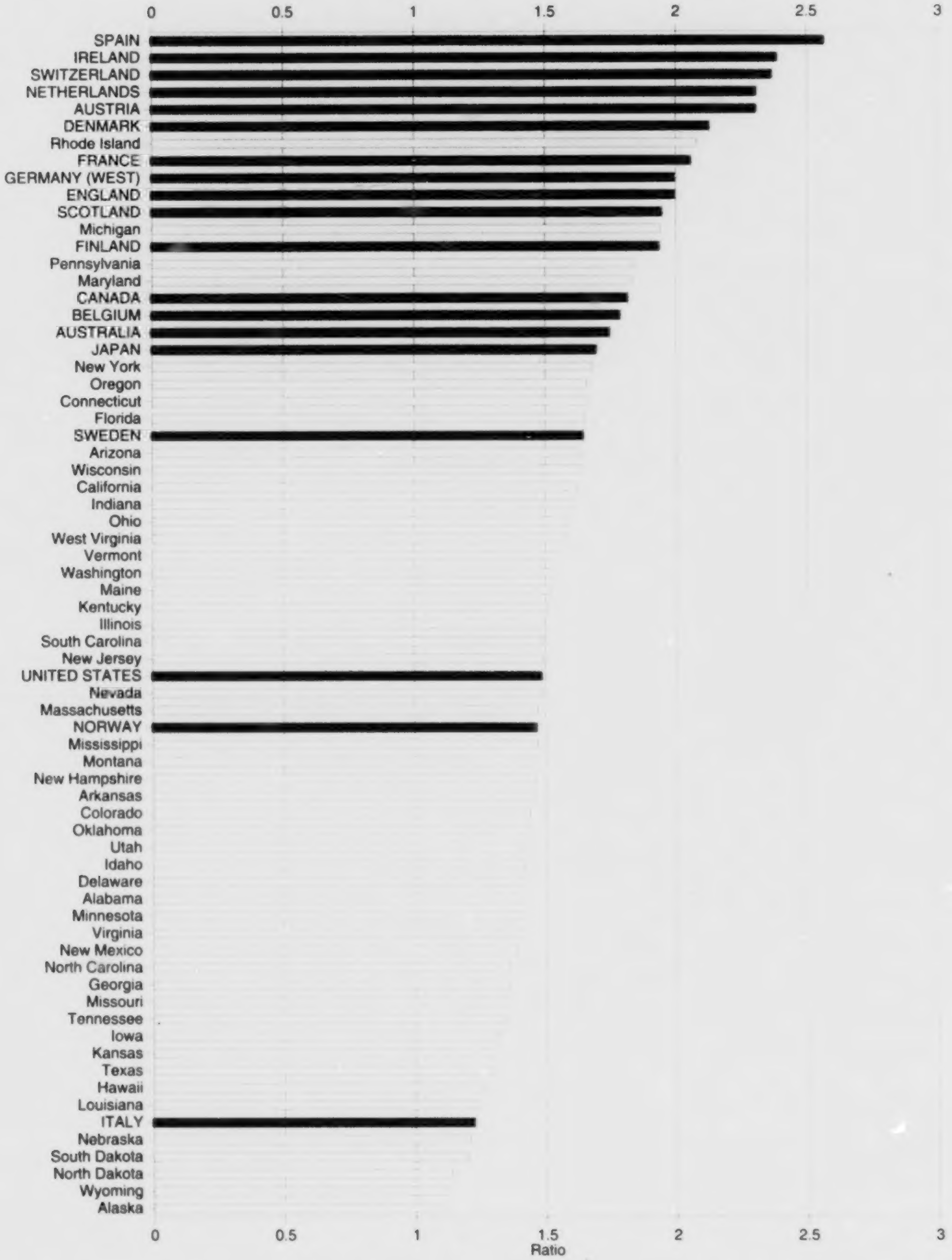
There exists disagreement about the relative length and intensity of a teacher's workday across countries. U.S. teachers tend to spend more time per day or per week in front of a class than do their international counterparts. But, this does not necessarily mean they have a greater workload. Teachers in other countries may spend more time planning their courses, preparing classes, and grading homework.

Figure 35a: **Annual teacher salaries for mid-career secondary school teachers (in other countries) and average annual primary and secondary school teacher salaries (in the United States), by country (1992) and state (1991–92)**



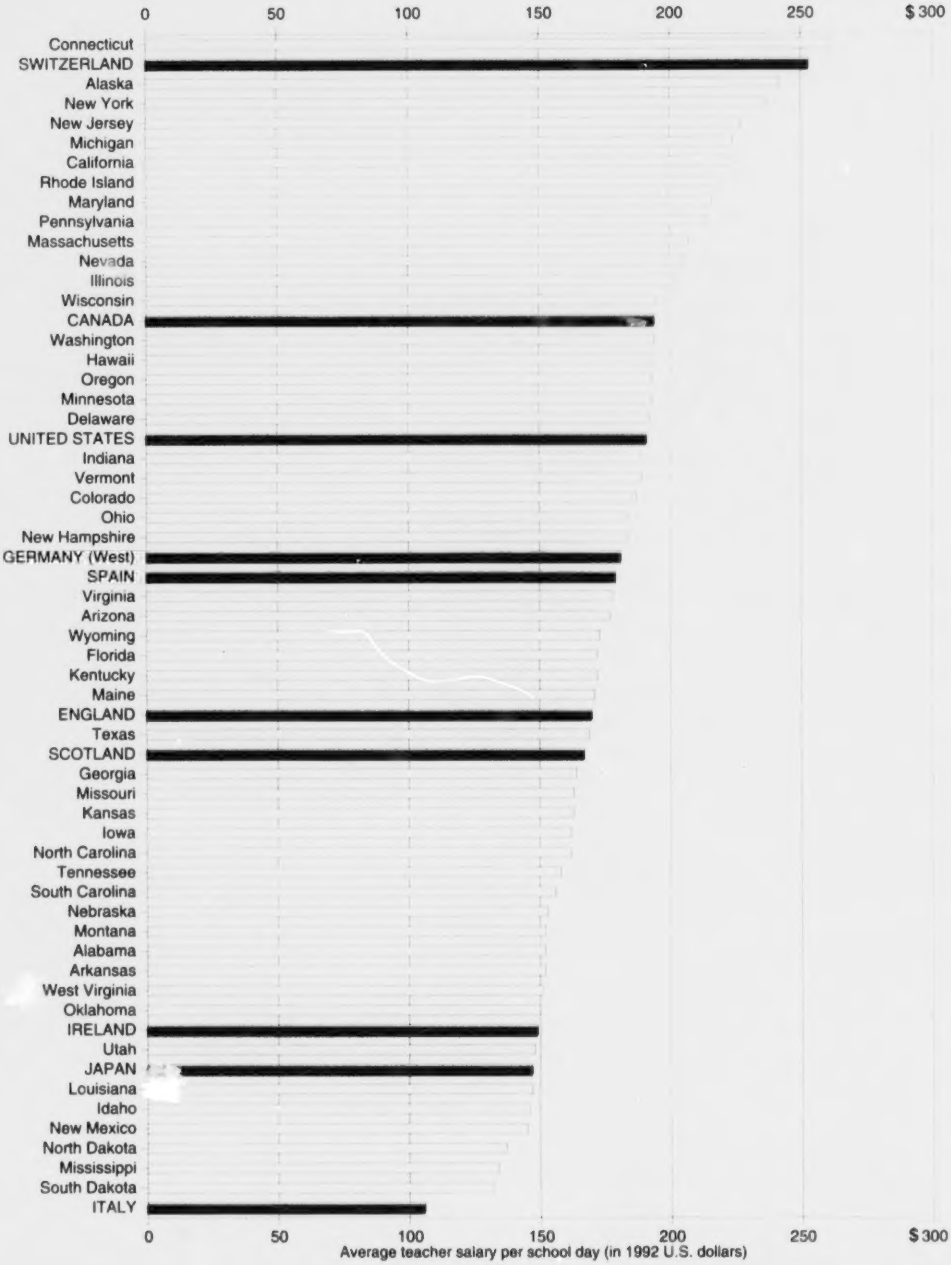
SOURCE: The American Federation of Teachers, Research Department, *Survey and Analysis of Salary Trends, 1993,* Table IV-6; *How U.S. Teachers Measure Up Internationally,* 1993.

Figure 35b: **Ratio of annual teacher salaries for mid-career secondary school teachers (in other countries) and average primary and secondary school teacher salaries (in the United States) to per capita gross product, by country (1992) and state (1991–92)**



SOURCE: The American Federation of Teachers, Research Department, *Survey and Analysis of Salary Trends, 1993*, Table IV-6; *How U.S. Teachers Measure Up Internationally*, 1993.

Figure 35c: **Teacher salaries for mid-career secondary school teachers (in other countries) and average primary and secondary school teacher salaries (in the United States) per school day (in U.S. dollars), by country (1992) and state (1991–92)**



SOURCE: American Federation of Teachers, Research Department, *Survey and Analysis of Salary Trends*, 1993, Table IV-6. U.S. Department of Education, National Center for Education Statistics, *Condition of Education, 1993*, Table 49-3; Schools and Staffing Survey, 1990–91. Educational Testing Service, International Assessment of Education Progress, *Learning Mathematics*, Figure 5.2. For Germany: International Association for the Evaluation of Educational Achievement (IEA) Study of Reading Literacy, 1992. For Japan: Ministry of Education, Science, and Culture, National Institute of Educational Research, Government of Japan, 1992.

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Table 35a: Annual mid-career secondary school teacher salary (in U.S. dollars) and ratio of teacher salary to gross domestic product per capita, by country: 1992

Country	Mid-career secondary school teacher salary	Years of teaching experience at mid-career level	Ratio of mid-career teacher salary to GDP per capita
Australia[1]	$28,991	9	1.75
Austria	42,424	15	2.31
Belgium	32,070	15	1.79
Canada[2]	36,469	13	1.82
Denmark	39,213	14	2.13
England	32,709	10	2.00
Finland	31,396	15	1.94
France	39,233	15	2.06
Germany (West)	39,555	15	2.00
Ireland	28,525	15	2.39
Italy	21,566	15	1.23
Japan	32,277	15	1.70
Netherlands	39,552	15	2.31
Norway	25,720	15	1.47
Scotland	31,934	13	1.95
Spain	33,687	15	2.57
Sweden	27,596	15	1.65
Switzerland[3]	52,358	12	2.37
United States[4]	34,027	16	1.49

[1] Data represent the unweighted average of three Australian provinces – New South Wales, South Australia, and Victoria.

[2] Data represent the unweighted average of two Canadian provinces – Saskatchewan and Québec.

[3] Data represent the unweighted average of three Swiss cities – Zurich, Basel, and Glarus.

[4] Data applies to the 1991-1992 school year, which covers the last four months of 1991, and the first eight months of 1992. Figure represents the average annual salary for primary and secondary school teachers.

NOTE: Salaries for all countries are adjusted to U.S. dollars using a purchasing power parity index (PPPI). Most salary data apply to calendar year 1992. See supplemental note on pp. 298-299 for details on the data from Sweden and the United States, and for a note on adjustments of salary data across countries and characteristics of the data sources.

SOURCE: The American Federation of Teachers, Research Department, *Survey and Analysis of Salary Trends, 1993,* Table IV-6; *How U.S. Teachers Measure Up Internationally*, 1993.

Table 35b: Average annual primary and secondary school teacher salary, average number of years of teaching experience, and the ratio of average annual teacher salary to gross state product per capita, by state: School year 1991–92

State	Average teacher salary	Average years of teaching experience	Ratio of average teacher salary to GSP per capita
Alabama	$26,954	14	1.42
Alaska	43,800	13	1.10
Arizona	31,176	13	1.64
Arkansas	27,168	12	1.46
California	40,425	16	1.62
Colorado	33,072	14	1.44
Connecticut	47,510	16	1.66
Delaware	34,548	16	1.42
District of Columbia	39,673	19	0.52
Florida	31,070	14	1.65
Georgia	29,539	13	1.36
Hawaii	34,488	17	1.27
Idaho	26,345	13	1.42
Illinois	36,528	16	1.50
Indiana	34,247	15	1.61
Iowa	29,196	16	1.32
Kansas	29,101	14	1.31
Kentucky	30,880	15	1.51
Louisiana	26,411	14	1.24
Maine	30,097	14	1.52
Maryland	39,073	16	1.83
Massachusetts	37,256	16	1.47
Michigan	40,700	17	1.94
Minnesota	33,700	16	1.41
Mississippi	24,368	14	1.47
Missouri	28,923	14	1.35
Montana	27,590	14	1.47
Nebraska	27,231	14	1.21
Nevada	36,989	14	1.49
New Hampshire	33,170	13	1.46
New Jersey	41,027	16	1.49
New Mexico	26,244	14	1.39
New York	43,335	16	1.68
North Carolina	29,334	14	1.36
North Dakota	24,495	13	1.14
Ohio	33,198	15	1.59
Oklahoma	26,514	12	1.44
Oregon	34,101	14	1.66
Pennsylvania	38,715	17	1.84
Rhode Island	39,367	18	2.08
South Carolina	28,209	13	1.49
South Dakota	23,291	13	1.20
Tennessee	28,621	14	1.35
Texas	29,719	12	1.30
Utah	26,524	12	1.42
Vermont	33,200	14	1.55
Virginia	32,243	14	1.40
Washington	34,880	15	1.54
West Virginia	27,366	14	1.58
Wisconsin	35,227	16	1.64
Wyoming	30,425	14	1.13

SOURCE: The American Federation of Teachers, Research Department, *Survey and Analysis of Salary Trends, 1993,* Table IV-6; *How U.S. Teachers Measure Up Internationally,* 1993.

Table 35c: Mid-career secondary school teacher salary (in U.S. dollars) per school day and number of school days per year, by country: 1992

Country	Number of school days per school year	Average teacher salary per school day
Canada	188	$194
England	192	170
Germany (West)	219	181
Ireland	173	149
Italy	204	106
Japan	220	147
Scotland	191	167
Spain	188	179
Switzerland	207	253
United States*	178	191

*Data applies to the 1991-1992 school year, which covers the last four months of 1991, and the first eight months of 1992. Figure represents the average annual salary for primary and secondary school teachers.

NOTE: Salaries for all countries adjusted to U.S. dollars using a purchasing power parity index (PPPI). Most salary data apply to calendar year 1992. See supplemental note on pp. 298-299 for details on the data from Sweden and the United States, and for a note on adjustments of salary data across countries and characteristics of the data sources.

SOURCE: Educational Testing Service, International Assessment of Education Progress, *Learning Mathematics*, Figure 5.2. For Germany: International Association for the Evaluation of Educational Achievement (IEA) Study of Reading Literacy, 1992. For Japan: Ministry of Education, Science, and Culture, National Institute of Educational Research, Government of Japan, 1992. The American Federation of Teachers, Research Department, *Survey and Analysis of Salary Trends*, 1993, Table IV-6.

Table 35d: Average primary and secondary school teacher salary per school day and number of school days per year, by state: School year 1991–92

State	Number of school days per year	Average teacher salary per school day
Alabama	177	$152
Alaska	181	242
Arizona	176	177
Arkansas	179	152
California	181	223
Colorado	177	187
Connecticut	182	261
Delaware	180	192
District of Columbia	182	218
Florida	181	172
Georgia	180	164
Hawaii	178	194
Idaho	180	146
Illinois	181	202
Indiana	181	189
Iowa	180	162
Kansas	179	163
Kentucky	180	172
Louisiana	180	147
Maine	176	171
Maryland	181	216
Massachusetts	180	207
Michigan	182	224
Minnesota	175	193
Mississippi	182	134
Missouri	177	163
Montana	181	152
Nebraska	178	153
Nevada	180	205
New Hampshire	180	184
New Jersey	181	227
New Mexico	181	145
New York	183	237
North Carolina	181	162
North Dakota	179	137
Ohio	180	184
Oklahoma	177	150
Oregon	177	193
Pennsylvania	181	214
Rhode Island	180	219
South Carolina	181	156
South Dakota	176	132
Tennessee	181	158
Texas	176	169
Utah	179	148
Vermont	176	189
Virginia	181	178
Washington	180	194
West Virginia	181	151
Wisconsin	181	195
Wyoming	176	173

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Condition of Education, 1993,* Table 49-3, Schools and Staffing Survey, 1990–91. The American Federation of Teachers, Research Department, *Survey and Analysis of Salary Trends,* 1993, Table IV-6.

Indicator 36: Sources of funds for primary and secondary education

This indicator traces the path of education expenditures back to their origin among the levels of government and between public and private sources. Tracking funds for primary and secondary education to their initial source illuminates where responsibility is actually assumed in a nation or state for financing primary and secondary education. The initial source of money for education often differs from the ultimate spender. For example, though local school districts in the United States generally operate and fund the local public schools, much of the financing arrives in the form of transfers from State governments. Some of the state money, in turn, arrives in the form of transfers from the Federal government. The *initial sources* of those transferred funds, then, are State and Federal governments. Likewise, the initial source of funds spent on public schools can be either public or private. Student tuition and fees are one example of a private source of public expenditure. Funding by private firms of public school youth apprenticeship programs in Germany and Austria is another example. Moreover, the initial source of funds spent on *private* schools can be either public or private. Unlike the United States, most other OECD countries maintain large numbers of privately-operated schools that are mostly or entirely publicly funded.

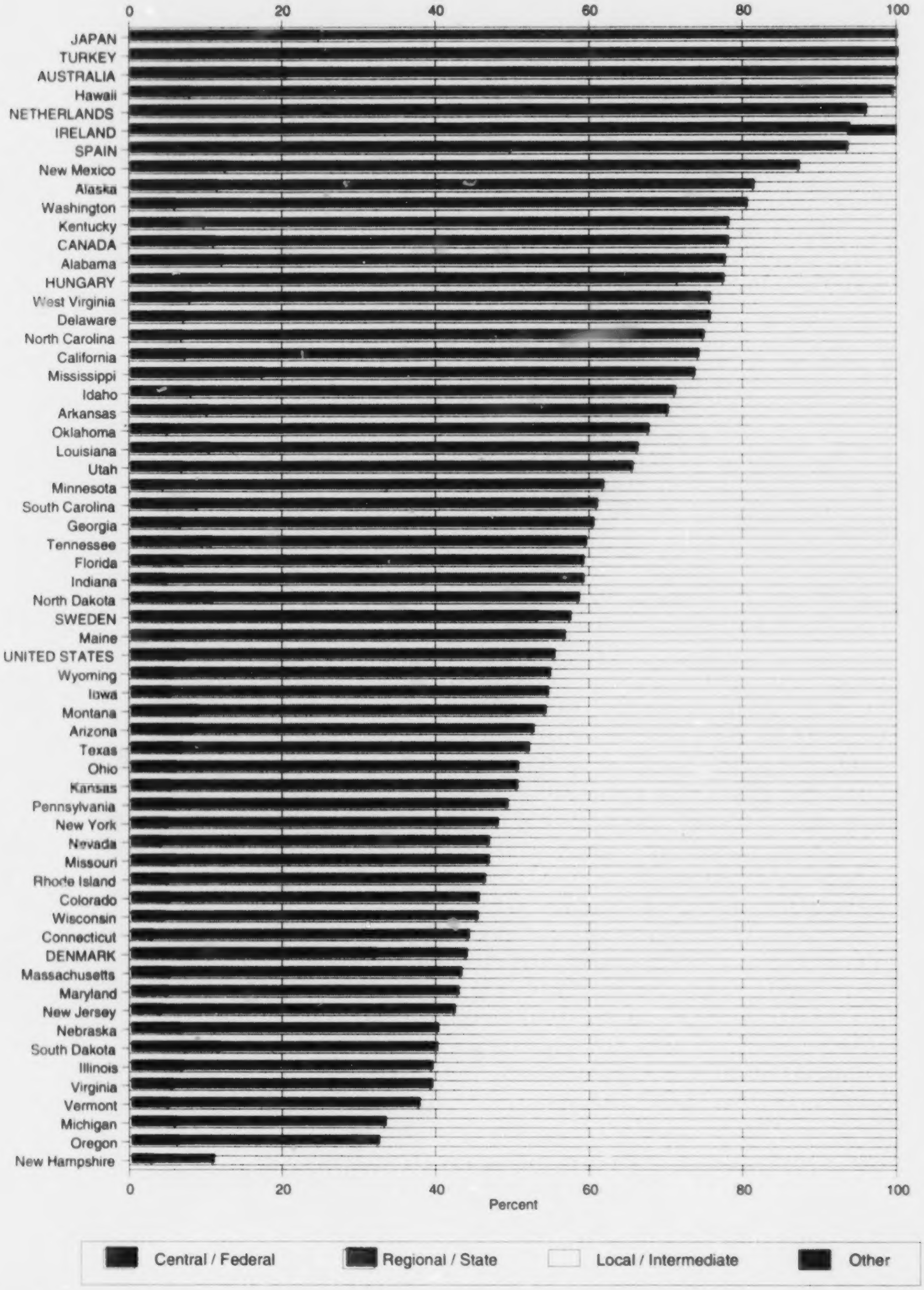
- **Among the 10 other countries reporting data by level of government, only Denmark raised a larger proportion of public funds for expenditure on primary and secondary education at the local level (56 percent) than did the United States (45 percent) in 1991. All of the 10 other countries raised a larger proportion of education expenditure at the national (i.e., central or federal) level than did the United States (7 percent). Of the three G-7 countries reporting data by level of government, the United States raised the smallest proportion at the national level and the largest proportion at the local level. Canada and Japan also raised a larger proportion of education expenditure at the regional or state level (67 and 75 percent, respectively) than did the United States (48 percent).**

- **Of the 10 other countries reporting public expenditure data by level of government, only Canada raised less money for education at the national level (11 percent) than did Mississippi (17 percent), the U.S. state that relied the most on the Federal government for education funds.**

Note on interpretation:

Data are available by initial source of funds for both *public and private* schools across most OECD countries, as presented in Table 36a. For U.S. states, however, data are available by initial source of funds for *public* schools only. Whereas public funds can account for substantial proportions of private school expenditures in some OECD countries, private schools in the United States receive a very small proportion of their funding from public sources.

Figure 36: Distribution of public expenditure on primary and secondary education, by initial source of funds, country, and state: 1991



NOTE: States and nations are sorted from high to low based on the sum of the percentages for central/federal and regional/state sources of funds.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance, 1993, Table P4(2). Statistics Canada. U.S. Department of Education, National Center for Education Statistics, Digest of Education Statistics, 1993, Table 157.

Table 36a: Distribution of public and private expenditure on primary and secondary education, by initial source of funds and country: 1991

			Public sources			
Country	Private	Public	Central/ Federal	Regional/ State	Local/ Intermediate	Other
Australia	12.2	87.8	20.4	79.6	0.0	—
Canada	—	—	11.0	67.0	22.0	—
Denmark	0.8	99.2	31.8	12.0	56.1	—
Germany (West)	38.7	61.3	—	—	—	—
Hungary	6.0	94.0	71.4	6.0	22.6	—
Ireland	4.9	95.1	93.7	0.0	0.1	6.2
Japan	8.8	91.2	24.7	75.3	0.0	—
Netherlands*	2.7	97.3	95.9	0.0	4.1	—
Spain	13.3	86.7	49.8	43.8	6.5	—
Sweden	0.0	100.0	53.2	4.3	42.6	—
Turkey	—	—	100.0	0.0	0.0	—
United States	8.4	91.6	7.1	48.2	44.7	—

— Not available or not applicable.
*Estimates based on 1990 data.

NOTE: Row percentages may not sum to 100, due to rounding. See supplemental note to Indicator 36 on pp. 299-300 for details on data provided by the European Community countries, West Germany, Ireland, the Netherlands, and the United States; and on pp. 236-242 for notes on international comparisons of current public education expenditure.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table P4(2). Statistics Canada.

Table 36b: Distribution of public expenditure on public primary and secondary education, by initial source of funds and state: 1991

	Public sources		
State	Federal	State	Local and intermediate
Alabama	12.1	65.5	22.4
Alaska	11.5	69.8	18.7
Arizona	8.1	44.5	47.4
Arkansas	10.1	60.0	29.9
California	7.3	66.8	25.9
Colorado	4.9	40.5	54.6
Connecticut	2.9	41.2	55.9
Delaware	7.1	68.5	24.4
District of Columbia	8.6	0.0	91.4
Florida	6.9	52.2	40.9
Georgia	6.6	53.8	39.6
Hawaii	7.9	91.5	0.5
Idaho	8.0	63.2	28.9
Illinois	6.8	32.6	60.6
Indiana	4.7	54.3	40.9
Iowa	5.2	49.2	45.5
Kansas	5.1	45.3	49.5
Kentucky	9.7	68.4	21.9
Louisiana	10.4	55.8	33.8
Maine	5.5	51.2	43.3
Maryland	4.8	38.0	57.2
Massachusetts	5.2	38.0	56.8
Michigan	5.9	27.4	66.7
Minnesota	4.4	57.4	38.3
Mississippi	17.3	56.3	26.4
Missouri	5.8	40.9	53.2
Montana	8.8	45.5	45.8
Nebraska	6.4	33.7	59.9
Nevada	4.0	42.8	53.2
New Hampshire	2.9	8.0	89.1
New Jersey	4.0	38.3	57.7
New Mexico	12.5	74.6	12.8
New York	4.8	43.0	52.1
North Carolina	6.8	68.0	25.2
North Dakota	10.7	47.8	41.5
Ohio	5.9	44.7	49.4
Oklahoma	5.0	62.6	32.4
Oregon	6.3	26.2	67.6
Pennsylvania	5.3	43.9	50.8
Rhode Island	4.9	41.3	53.8
South Carolina	8.8	52.0	39.1
South Dakota	11.6	28.3	60.0
Tennessee	10.6	48.9	40.5
Texas	6.8	45.2	48.0
Utah	6.9	58.6	34.5
Vermont	5.0	32.7	62.3
Virginia	5.5	33.8	60.7
Washington	5.9	74.5	19.6
West Virginia	7.9	67.7	24.4
Wisconsin	4.3	41.0	54.7
Wyoming	5.5	49.3	45.2

NOTE: Excludes state education agencies' administrative expenses. Row percentages may not sum to 100, due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Table 157.

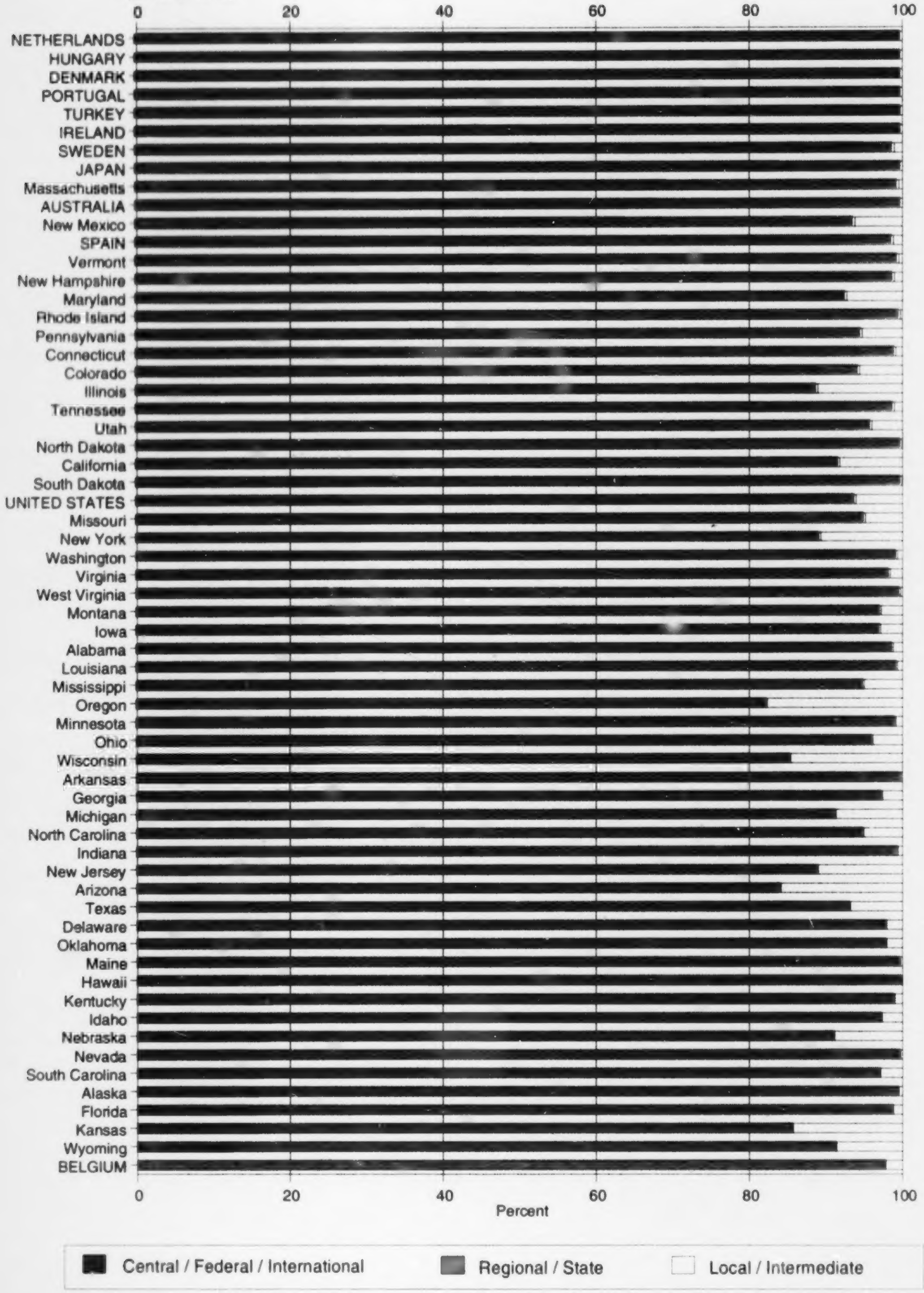
Indicator 37: Sources of funds for higher education

Tracking funds for higher education to their initial source illuminates where responsibility for financing higher education is actually assumed in a nation or state. Of total public expenditure on public and private institutions of higher education, this indicator separates the portions provided initially by each level of government — Central/Federal/International, Regional/State, and Local. It is important to note that the percentages measured here represent the *initial* source of funding, identifying the level of government *generating* the funds. This clarification is made necessary by the frequent occurrence of financial transfers between levels of government. For example, in some countries, central or regional governments disseminate a significant share of education funding to local authorities, who are ultimately responsible for distributing and administering the funds.

- **In the United States, state and local governments provided a greater portion of public education funding for higher education (62 plus 6 percent) than they did in 10 of the 11 other countries reporting data in 1991. Conversely, the percentage of funds derived initially from the central government was lowest in the United States (32 percent) among all the nations except for Belgium (0 percent). The United States and Belgium were the only two nations in which the share of public funding of institutions of higher education from the regional, or state, level exceeded 50 percent (62 and 98 percent, respectively).**

- **In 18 states, but in none of the other countries represented here, the share of public higher education expenditures provided at the local level was at least 5 percent. The largest proportion of public funding of higher education could be found at the state level for every state but Massachusetts, New Mexico, and Vermont, where federal funds were greatest.**

Figure 37: **Distribution of public expenditure on public and private institutions of higher education, by initial source of funds, country (1991) and state (1990–91)**



SOURCE: U.S. Department of Education, National Center for Education Statistics, Digest of Education Statistics, 1993, Tables 324 and 357. *Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education at a Glance,* 1993, Table P4(3).

Table 37a: Distribution of public and private expenditure on public and private institutions of higher education, by initial source of funds and country: 1991

			Public sources			
Country	Private	Public	Central/ Federal	Regional/ State	Local/ Intermediate	International
Australia	20.3	79.7	68.2	31.8	0.0	0.0
Belgium[1]	—	—	0.0	97.8	2.2	0.0
Canada	14.4	85.6	—	—	—	0.0
Denmark	0.0	100.0	100.0	0.0	0.0	0.0
Germany (West)	0.0	100.0	—	—	—	0.0
Hungary	6.7	93.3	100.0	0.0	0.0	0.0
Ireland[2]	14.3	85.7	67.6	0.0	0.0	32.4
Japan	60.8	39.2	84.1	15.9	0.0	0.0
Netherlands	0.2	99.8	100.0	0.0	0.0	0.0
Portugal	—	—	100.0	0.0	0.0	0.0
Spain	18.5	81.5	53.0	45.8	1.2	0.0
Sweden	0.0	100.0	95.2	3.7	1.1	0.0
Turkey	4.1	95.9	100.0	0.0	0.0	0.0
United States	43.8	56.2	32.1	61.8	6.1	0.0

— Not available.

[1] The Flemish and French Communities are classified here as 2 regions.

[2] The "international" source for Ireland is the European Community.

NOTE: Row percentages may not sum to 100, due to rounding. See supplemental note to Indicator 37 on pp. 299–300 for details on data provided by Belgium, the European Community countries, West Germany, Ireland, the Netherlands, and the United States; and on pp. 236–242 for notes on international comparisons of current public education expenditure.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance, 1993,* Table P4(3).

Table 37b: Distribution of public expenditure on public and private institutions of higher education, by initial source of funds and state: School year 1990–91

State	Federal	State	Local and Intermediate
Alabama	26.7	72.1	1.2
Alaska	15.9	83.6	0.5
Arizona	21.0	63.1	15.9
Arkansas	23.3	76.5	0.2
California	36.0	55.8	8.2
Colorado	37.5	56.9	5.6
Connecticut	37.6	61.5	0.9
Delaware	20.1	77.8	2.1
District of Columbia	79.4	1.2	19.4
Florida	15.8	83.0	1.2
Georgia	22.7	74.7	2.6
Hawaii	18.2	81.7	0.1
Idaho	17.7	79.6	2.7
Illinois	37.1	51.8	11.1
Indiana	21.6	77.8	0.6
Iowa	27.0	70.1	2.9
Kansas	15.8	69.9	14.3
Kentucky	17.8	81.2	1.0
Louisiana	26.0	73.3	0.7
Maine	18.7	81.0	0.3
Maryland	46.1	46.6	7.3
Massachusetts	69.3	30.2	0.5
Michigan	22.6	68.7	8.7
Minnesota	24.4	74.7	0.9
Mississippi	25.6	69.4	5.0
Missouri	30.7	64.4	4.9
Montana	27.2	70.0	2.8
Nebraska	17.3	73.8	8.9
Nevada	17.1	82.6	0.3
New Hampshire	46.8	52.1	1.1
New Jersey	21.3	67.7	11.0
New Mexico	64.0	29.8	6.2
New York	30.6	58.7	10.7
North Carolina	22.2	72.7	5.1
North Dakota	36.1	63.8	0.1
Ohio	24.2	71.9	3.9
Oklahoma	19.9	78.0	2.1
Oregon	24.9	57.4	17.7
Pennsylvania	39.1	55.6	5.3
Rhode Island	39.9	59.8	0.3
South Carolina	16.3	80.8	2.9
South Dakota	33.6	66.3	0.1
Tennessee	37.0	61.9	1.1
Texas	20.3	72.9	6.8
Utah	37.0	59.0	4.0
Vermont	52.0	47.5	0.5
Virginia	28.3	70.1	1.6
Washington	29.2	70.1	0.7
West Virginia	27.5	72.2	0.3
Wisconsin	24.0	61.4	14.6
Wyoming	12.6	78.8	8.6

NOTE: Revenue to state higher education agencies for their administrative expenses is not included. Includes expenditures of "independent operations" (e.g., federally funded research and development centers), which comprises a large proportion of Federal expenditures in several states, including California, Illinois, Maryland, Massachusetts, New Jersey, New Mexico, New York, Tennessee, and Virginia.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993,* Tables 324 and 357.

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Note on the inclusion of the District of Columbia

Due to the unique nature of the District of Columbia, its data were found to be highly volatile and, at times, different in character from that of the states. District of Columbia data, then, are included in the tables, but not in the figures, so as not to invite comparison.

Note on levels of education:
Indicators 3, 8, 10, 11, 12, 13, 15, 21, 22, 23, 24, 26, 27, and 28

The correspondence between *levels of education* and *years of school completed* (for the primary, lower secondary, and upper secondary levels)

Most countries represented here split their primary through secondary level schooling into three levels, referred to here as primary, lower secondary, and upper secondary. The number of years of schooling contained within each of these levels varies from country to country, however. Moreover, even within countries, different students may follow course patterns of different sequence or duration, sometimes depending on whether they follow a vocational track, a university-preparatory track, or some other track. The table below lists the years of schooling by grades that are contained in each level of education. Some countries offer more than one grade-level sequence in a particular level of education.

Table S1

Correspondence between levels of education and years of schooling, by level of education and country: 1989–90

Country	Primary	Lower secondary	Upper secondary
Australia	1-6 1-7	7-9 7-10 8-10	10-11 11-12
Austria	1-4	5-8	9-12 9-13
Belgium	1-6	7-9 7-10 7-11	10-12 10-13 11-13 11-12
Canada:			
▸ Ontario, Manitoba	1-8		9-12
▸ British Columbia	1-7	8-10	11-12
▸ Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick, and Alberta	1-6	7-9	10-12
▸ Québec	1-6		7-11
▸ Saskatchewan	1-5	6-9	10-12
Denmark	1-6	7-9 7-10	10-12 11-13
Finland	1-5	6-9	10-12
France	1-5	6-9 6-10	10-11 10-12

Country	Primary	Lower secondary	Upper secondary
Germany	1-4	5-9 5-10	10-12 11-12 11-13
Greece	1-6	7-8 7-9	9-10 10-11 10-12
Ireland	1-6	7-9	10-11
Italy	1-5	6-8	9-11 9-13
Japan	1-6	7-9	10-11 10-12 10-13
Netherlands	1-8	9-11 9-12	12-13 12-14 12-15
New Zealand	1-6	7-8	9-11 9-13
Norway	1-5	6-9	10-11 10-12
Portugal	1-5 1-6	6-8 7-9	9-10 10-12
Spain	1-5	6-8	9-12 9-13
Sweden	1-5	6-9	10-11 10-12
Switzerland	1-4 1-5 1-6	5-9 6-9 7-9	10-11 10-12 10-13 10-14
Turkey	1-5	6-8 6-9 6-10	9-11 9-12
United Kingdom	1-6	7-11	12-13 12-14
United States	1-5 1-6 1-8	6-8 7-8 7-9	9-12 10-12

SOURCE: Organization for Economic Co-operation and Development, ***Education in OECD Countries: A Compendium of Statistical Information, 1989/90***, Part One.

Differences in programs offered across education levels[1]

Educational programs in the OECD countries are classified as belonging to one of seven levels, which in the United States correspond to the following: preprimary (including kindergarten), elementary school, middle or junior high school, high school, non-baccalaureate higher education (e.g., 2-year higher education institutions or community colleges), baccalaureate education (e.g., 4-year degree programs at colleges and universities), and graduate school. While the education systems in many other countries are structured similarly to that of the United States in terms of these levels, the training and education offered at them can vary significantly, particularly at the high school level and above. For example, training offered at the non-baccalaureate higher education level in one country may be offered at the high school level in another, thus contributing to variation in enrollment rates across the levels.

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[1] The primary sources for this section include: U.S. Department of Labor, Bureau of Labor Statistics, ***How Workers Get Their Training*: *A 1991 Update***. Washington, D.C.: Author, 1992 and ***World Education*** series, American Association of Collegiate Registrars and Admissions Officers, Washington, D.C.: France, 1988; Austria, 1981; Federal Republic of Germany, 1986; and Belgium, 1985.

The profession of nursing is just one example of a case where comparable training takes place at different education levels in different countries. In the United States, most nurses (licensed practical nurses and registered nurses) receive their qualifying training in either post-high school vocational training programs, junior colleges, or technical institutions, which are considered non-baccalaureate higher education programs; or four-year or longer college programs, which are considered baccalaureate programs. Comparable training in other countries does, in some cases, take place in non-baccalaureate higher education programs, but rarely in baccalaureate programs. In France, nurse training occurs in non-baccalaureate higher education programs, but rarely in baccalaureate programs. In France, nurse training occurs in non-baccalaureate higher education programs at public and private schools of nursing. The program is 33 months long and the competitive entrance examination for it is open to students who have completed their final year of *lycée*, schools roughly comparable to American high schools. In Austria and Germany, however, nurse training occurs at the high school level in full-time nurse training schools. Although these programs are considered high school-level programs, in Germany, students entering the three-year program must be at least 17 years old and must have already completed ten years of general education. In Belgium, the four-year nursing program requires nine years of compulsory education, and some schools prefer students who have received the maturity certificate, which is typically required of students entering postsecondary education.

Consideration of these situations is especially pertinent when examining enrollments at the high school and non-baccalaureate higher education levels. Upper secondary level apprenticeship and vocational programs in several OECD countries, including Germany, Switzerland, Austria, and Denmark, provide the type of specialized occupational training that in the United States does not take place until after high school. But, even at the baccalaureate and graduate school levels, however, there are some significant differences in the types of programs offered.

Note on *enrollment reference groups* and *graduation* and *entry reference ages*: Indicators 8, 11, 23, 24, and 29

Enrollments

Enrollment ratios allow comparisons across states and countries by standardizing enrollment in education at a particular level to the size of the population in an age group typical for enrollment in that level. Indicator 8 presents an overall enrollment ratio for all levels of education. The ratio should not be interpreted as an enrollment *rate* (that is, as the percent of students in a particular age range who are enrolled at that level of education). This ratio compares the number of students enrolled in particular levels of education to the number of people in the age *ranges* that represent the usual ages of students at those levels of education. More importantly, the *width* of the age range best approximates the average duration of study at these levels of education.

For Indicator 8, the ratio is calculated by dividing the number of students of *any* age enrolled in particular levels of education by the population in the *enrollment reference group* (the population in the age range typical for enrollment at those levels) and multiplying by 100:

$$\textit{enrollment ratio} = \frac{\textit{students of any age enrolled in education level}}{\textit{population in enrollment reference group}} \times 100$$

This ratio thus represents the number of enrolled students per 100 people in the enrollment reference group. Under some conditions the enrollment ratio would be a fairly good estimate of the enrollment rate For example, if in a particular country all students begin primary (elementary) education at nearly the same age, say 6, and if grade retention, repetition, and skipping is rare, then the ratio of students enrolled in grades 1 through 6 divided by the number of children between the ages of 6 and 11 would be a good estimate of the enrollment rate in elementary education. However, these conditions rarely hold for enrollment in higher education, and often do not hold for enrollment in upper secondary (high school) education.

To identify enrollment reference groups for each country, countries specified an age typical for beginning education at each level and the number of years typically required for completing education at each level. If this number of years is less than the actual average number of years required for completing education at that level, then, in a sense, the population reference group is too small, and the ratios too large. This is more likely to be a factor in education systems where retention and repetition are common, where a substantial number of students attend part-time, or where a substantial number of students enter the system again even after already earning a credential at that level.

Fortunately, because the sizes of different age cohorts within the same general age range are approximately equal, an enrollment ratio is relatively insensitive to the selection of the age typical for beginning students, but relatively sensitive to the selection of the age range or typical duration of education at that level. For example, dividing the number of students enrolled in upper secondary school in Norway by the population in the 16- to 18-year-old age range would yield almost the same result as dividing it by the population in the 17- to 19-year-old age range, an age range of 3 years in both cases. The reason is that the population of 16-year-olds and 19-year-olds are likely to be similar and so the result insensitive to whether one includes one age cohort or the other in the population reference group. However, dividing by the population of 16- to 19-year-olds, an age range of 4 instead of 3, would yield a substantially (approximately 25 percent) smaller ratio. So it is important that the age range in the population reference group be a close approximation of the actual average duration required to complete a particular level of education.

Table S2 lists countries' reference age groups — enrollment reference groups and university entry and graduation reference ages.

University completion

Similarly, the numbers of university degree recipients were standardized for comparison purposes as ratios of first-degree (i.e., undergraduate — e.g., bachelor's degree in the United States), university graduates per 100 people at the *graduation reference age*. Even though many students receive degrees at ages other than the graduation reference age, the ratio nevertheless

Table S2

Enrollment reference groups—typical starting ages and years of completion for upper secondary and higher education—and university entry and graduation reference ages

Country	Upper secondary			Non-university higher education		Higher education	University (undergraduate and graduate)	
	Typical starting age	Typical duration	Graduation reference age	Typical starting age	Typical duration	Entry reference age	Typical duration	Graduation reference age
Australia	16	2	17	18	3	18	7	21
Austria	14	5	18	19	4	19	7	23
Belgium	15	4	17	18	4	18	8	22
Canada	15	3	17	18	3	18	9	22
Czechoslovakia	15	4	17	18	2	18	7	22
Denmark	16	3	19	19	3	19	7	22
Finland	16	3	18	19	3	19	7	23
France	15	3	17	18	3	18	7	21
Germany	16	3	–	18	3	18	10	25
Germany (West)	16	3	18	19	2	19	10	25
Hungary	15	4	18	19	4	19	5	23
Ireland	16	2	17	18	2	18	6	21
Italy	14	5	18	19	4	19	8	22
Japan	15	3	17	18	3	18	8	22
Luxembourg	15	4	18	19	3	19	7	23
Netherlands	16	3	18	18	4	18	8	22
New Zealand	15	4	17	18	3	18	7	21
Norway	16	3	18	19	2	19	6	22
Portugal	15	3	17	18	3	18	8	22
Spain	14	4	17	18	3	18	6	21/23
Sweden	16	3	18	19	3	19	7	23
Switzerland	16	4	19	20	3	20	7	26
Turkey	15	4	17	18	2	18	9	23
United Kingdom	14	5	17	18	3	18	6	21
United States	15	3	17	18	2	18	7	22

– Data not available for this category.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, ***Education at a Glance***, 1993, Tables P11(B), P11(C), P11(D), P15, R5, and R6.

allows useful comparisons across countries because it places the number of graduates in relation to the size of a typical cohort of students. Assuming that the sizes of different age cohorts within the same general age range are approximately equal, the ratio will not be significantly affected if large numbers of students receive degrees at ages other than the graduation reference age. This measure may even include some graduates receiving second undergraduate degrees.

Entry to higher education

Similarly, the numbers of entering students were standardized for comparison purposes as ratios of new entrants per 100 people at the *entry reference age*. Even though many students enter higher education at ages other than the entry reference age, the ratio nevertheless allows useful comparisons across countries because it places the number of new entrants in relation to the size of a typical cohort of students. Assuming that the sizes of different age cohorts within the same general age range are approximately equal, the ratio will not be significantly affected if large numbers of students enter university at ages other than the entry reference age. It will, however, be significantly affected if large numbers of students *re-enter* university for second undergraduate degrees (entrants to graduate programs are not included).

Note on international comparisons of current public education expenditures: Indicators 30 to 34, 36 and 37

Use of current public education expenditure

These indicators include only current public education expenditure. *Current* expenditure is used for educational goods and services whose life span should not in principle exceed the current year (salaries of personnel, school books and other teaching materials, scholarships, minor repairs and maintenance to school buildings, administration, etc.). Current expenditure excludes both capital expenditure (construction of buildings, major repairs, major items of equipment, vehicles) and the servicing of debt.

Public expenditure excludes private spending. Public education expenditure includes funds channeled to both public and private schools by Federal, state, and local governments, either directly or through students. This includes expenditures at public schools funded by public sources and subsidies to students at private schools from government agencies.

Per-student expenditure, as it is used here, excludes private spending but includes private-school students. It is calculated as current public expenditure for education divided by enrollment at both public and private schools. Thus, this is a measure of average public investment per student in the education system. It is not a measure of the total resource a student receives, which would include private expenditure.

Private expenditure

Data on private education expenditure were not available for the U.S. states or for several of the countries. To illustrate how the inclusion of private spending might affect the country-level comparisons, the table below presents current education expenditure as a percentage of GDP, by G-7 country and public or private source. Among the five G-7 countries for whom private expenditure data were available, considering private expenditure does change their relative rankings. France would be ranked second and the United States third based on public current expenditures alone. But, the United States would be ranked second and France third based on both public and private current expenditure.

Table S3

Current education expenditure at the primary through higher education levels as a percentage of GDP, by source and country: 1991

Country	Public sources	Private sources	Total
Canada	6.12	0.68	6.80
France	4.62	0.35	4.97
Germany (West)	3.29	1.48	4.77
Italy*	4.13	—	—
Japan	3.11	0.82	3.93
United Kingdom	—	—	—
United States	4.57	1.20	5.77

— Not available.
* 1989 data.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation.

Though the addition of private education expenditure may affect the country rankings on current education expenditure at the primary through higher education levels only slightly, it could profoundly affect the country rankings in certain categories of expenditure. In certain countries, for example, private sources account for a large portion of total higher education expenditure. Most notable among those countries with some private expenditure on higher education are Australia, Canada, Japan, and the United States, four countries with especially large private proportions.

Table S4

Current higher education expenditure per student (in U.S. dollars), by source and country: 1991

	Public sources	Private sources	Total
Australia	$7,830	$1,995	$9,825
Canada	8,556	1,439	9,995

	Public sources	Private sources	Total
Denmark	7,160	0	7,160
Finland	6,357	530	6,887
France	5,048	494	5,542
Germany (West)	5,539	0	5,539
Hungary	5,855	420	6,275
Japan	2,362	3,662	6,024
Netherlands	8,552	17	8,569
Spain	2,778	630	3,408
Sweden	8,204	0	8,204
United Kingdom	10,228	0	10,228
United States	6,767	5,274	12,041

SOURCE: Organization for Economic Cooperation and Development, Center for Educational Research and Innovation.

Table S5

Current expenditure on higher education as a percentage of GDP, by source and country: 1991

	Public sources	Private sources	Total
Australia	1.41	0.36	1.77
Canada	2.08	0.35	2.43
Denmark	1.19	0.00	1.19
Finland	1.23	0.10	1.33
France	0.83	0.08	0.91
Germany (West)	0.79	0.00	0.79
Hungary	0.84	0.06	0.90
Japan	0.27	0.42	0.69
Netherlands	1.53	0.00	1.53
Spain	0.68	0.16	0.84
Sweden	1.07	0.00	1.07
United Kingdom	1.01	0.00	1.01
United States	1.17	0.91	2.08

SOURCE: Organization for Economic Cooperation and Development, Center for Educational Research and Innovation.

Unlike the United States, other countries have left unallocated some expenditures that are difficult to attribute accurately to levels of education, such as those for regional or national education agency administrative expenses and those for ungraded courses, which are sometimes in special, vocational, and adult education programs. If an appropriate proportion of these "undistributed" expenditures were added to the country figures in Tables S4 and S5, those figures would, of course, increase for some of the countries.

Table S6

Estimated higher education proportion of undistributed current public education expenditure, by country: 1991

	(in $ per student)	(as % of GDP)
Australia	$0	0.00
Canada	0	0.00
Denmark	208	0.03
Finland	601	0.12
France	205	0.03
Germany (West)	720	0.10
Hungary	169	0.03
Japan	442	0.06
Netherlands	293	0.05
Spain	74	0.02
Sweden	0	0.00
United States	0	0.00

SOURCE: Organization for Economic Cooperation and Development, Center for Educational Research and Innovation.

How expenditures are compared across countries

To compare public expenditure-per-student in the United States with expenditures-per-student in other countries, expenditures must be converted to a common currency.

Purchasing Power Parity Indices (PPPI) are calculated by comparing the cost of a fixed market basket of goods in each country. Changes over time in a PPPI are determined by the rates of inflation in each country. A PPPI is not as volatile as market exchange rates.[2] Measures of education expenditure and GDP/GSP used in this report have been adjusted with a PPPI.

Because the fiscal year has a different starting month in different countries, within-country consumer price indexes (CPI) calculated by the International Monetary Fund were used to adjust educational expenditure data to allow for inflation between the starting month of the fiscal year and July 1, 1991.

Problems in comparing education expenditures across countries

There exists some variation in the coverage and the character of the education expenditure data that countries submit to the OECD. Sometimes, an individual expenditure item may be included in the expenditure data from one country, but not included in the expenditure data from another. Discrepancies arise because one country may collect certain kinds of data that another country either does not collect, or does not collect in its "education" data collections. Or, one country may define what constitutes an "education" expenditure differently than another country does.

Discrepancies between which expenditure items are included in one country's expenditure figures and not in another's tend to arise in three general domains:

- **Non-instructional (or, ancillary) services** — Some countries provide fewer ancillary services in their schools and, thus, include fewer expenditures for such services in their education expenditure figures. Examples of ancillary services are: school cafeterias; dormitories; school sports programs; school health clinics or visiting school nurses; attendance (i.e. truancy) services; and speech or psychological therapy services. U.S. schools tend to subsidize relatively more ancillary services through their education budgets than do schools in most other countries. In some countries (eg. Germany), *none* of the aforementioned services are provided at the primary and lower secondary levels by many schools.

- **Private expenditures** — Some countries' education systems receive large private contributions. The most common forms of private contributions to education are student tuition or fees; organizational subsidies, such as those provided by religious denominations to their own schools; and corporate in-kind contributions, such as those provided by German and Austrian firms that provide vocational courses on the shop floor for participating youth apprentices. Private expenditures have not been included in the indicators used in this report, in part because precise figures for private education expenditures are not available for the U.S. nor for several other countries.

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[2] For a further argument against using market exchange rates, see Rasell, Edith M. and Lawrence Mishel, ***Shortchanging Education***, Economic Policy Institute, January 1990.

- **The boundaries of education** — There exist fewer (though, still some) inconsistencies in comparing just the *instructional* expenditures for *primary and secondary public* education in just the *academic* track. But, the "borderlands" of education cause comparability problems. The borderlands include: preprimary education and daycare; special education; adult education; vocational and technical education; and proprietary education. Some countries, for example, simply do not collect expenditure data for private "center-based" daycare as they do not define such to be "education." Indeed, in some countries, even public daycare is not managed by education authorities; rather, it is the responsibility of human services departments.

  The exact location of each "boundary" also varies from country to country and even within each country. In Canada, for example, vocational/technical students in Québec who so choose enter vocational/technical college in the 12th grade. In the other Canadian provinces with vocational/technical colleges, entry is in the 13th or the 14th grade. Thus, vocational/technical students in the other provinces spend more another year or two at the upper secondary level. The more time the average student spends in a level of education, the greater will be the expenditure at that level.

Even these three domains do not include all the possible comparability problems. There remain, for example, inconsistencies in how different countries treat public contributions to teacher retirement and fringe benefits, student financial aid, and university research and hospitals.

The National Center for Education Statistics (NCES) has sponsored two studies designed to examine the issue of the comparability of national figures of education expenditure. The studies, entitled ***The International Expenditure Comparability Study*** and ***Improving the Comparability of International Expenditure Data***, involve ten countries and examine, in detail, the content of their education expenditures, as they are reported to the OECD.

Thus far, participating education ministries have been receptive to the idea of improving comparability in the OECD data collection. Indeed, some countries have already modified their data submissions to the OECD for subsequent years, thus improving the comparability of education expenditures across countries for the data collection used in ***The Condition of Education 1995***. These changes were motivated in part by preliminary findings from the NCES expenditure comparability studies.[3]

Expenditures in the United States

Primary through secondary

For the United States totals, current public expenditure for *primary through secondary education* includes current expenditure in state education agencies and local public school districts funded by state and local taxes and Federal programs administered by the U.S. Department of Education (ED). Programs operated outside of ED that are not administered by state or local education agencies (e.g, Department of Defense Schools, and schools operated by the Bureau of Indian Affairs) and Federal expenditures to operate ED and other activities (such as research, statistics, assessment, and school improvement) are included in the current public expenditure figure for the United States that is used in the international tables but not in the state-level data.

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[3] See Barro, Stephen M. *Preliminary Findings from the Expenditure Comparability Study*, SMB Economic Research, Inc., June, 1993.

While only *public* expenditures are included in the finance indicators, both *public and private* school enrollments are included in Indicators 32 and 33.

Higher education

Current public expenditure for higher education in the United States includes expenditure at both public and private colleges and universities funded by Federal, state, and local governments. Current expenditure by public and private non-profit institutions is separated into public and private expenditure based on the share of current fund revenues from Federal, state, and local sources. Tuition payments are considered to be private expenditures that may or may not be derived from public sources (e.g., Pell Grants).

Most Federal aid goes to students who then spend it on education (e.g., tuition) and non-education (room and board) services. It was assumed that 60 percent of Federally administered Pell Grants were spent by students on education expenditure.

The U.S. national figure contains some expenditures that are not included in the state-level figures. They include: U.S. Education Department administrative expenses and Department of Defense expenditures on the service academies.

Indicators 3, 21, 22, 26, 27, and 28: Note on labor force participation, educational attainment of the population, educational equity for women, unemployment and education, education and earnings, and gender differences in earnings

Notes on Figures and Tables

Australia

Estimates are based on self-reported information about the number of years of schooling and the highest diploma or degree obtained.

The data do not refer to the age groups 25-to-64 and 55-to-64 but to the groups 25-to-69 and 55-to-69 years of age.

The gender differences in educational attainment can partly be explained as a result of the method used to allocate individuals to levels of education. In the past, persons who transferred from lower secondary education to apprenticeship programs (mostly men) were classified at the upper secondary level, whereas those who transferred directly to nurse and teacher education programs (mostly women) were classified as non-university higher education. In the current classification system nurse and teacher education programs are considered as university education. Because a wide age band is examined in Indicators 21 and 22, it will take a number of years before the impact of the current classification system is fully reflected in the data.

Austria

Classifications for the upper secondary to graduate-school levels of education are based on the highest diploma received; whereas those for the preprimary to lower secondary levels refer to the number of years of schooling obtained. Because of the data structure, non-university higher education graduates are reported at the upper secondary level.

Belgium

Estimates are based on self-reported information about the highest diploma or degree obtained. The data are collected by means of a labor force survey.

Canada

Classification to the primary through upper secondary levels is based on the number of years of schooling, and on obtained diplomas and degrees for the higher education levels.

Czechoslovakia

Data refer to the population 25 years of age and over. For the age group 55–64 years, the data in fact refer to the group aged 55 years and older.

Non-university higher education is included in the upper secondary level. One per cent or less of the total is not classified by level. Missing data were proportionally redistributed.

Finland

Data are derived from the ***Register of Completed Education and Degrees***. The register contains information about educational qualifications at the upper secondary through graduate school levels, as attained within the regular school and university system. Adult education and apprenticeship programs are excluded.

France

Classification is based on diplomas for all levels except the preprimary and primary levels. The upper secondary level is very complex as it refers to general, vocational and professional education. The professional programs in the upper secondary level lead to three separate diplomas. One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Germany

The survey data refer to the populations living in the territory of the former German Democratic Republic (East Germany) as well as in the former territory of the Federal Republic of Germany (West Germany). Only obtained diplomas or degrees are considered in classifying persons in the upper secondary through graduate school levels (i.e., persons must complete *all* requirements, including successful performance on any required exit exam, before being counted at a particular educational attainment level). The data include 11 per cent non-response, which was proportionally redistributed across the education levels.

Ireland

Classification to level of education is made by level of certificate, with the exception of the preprimary and primary levels, where the number of years of schooling is used. A significant number of people who have completed apprenticeship programs equivalent to upper secondary education are classified at the lower secondary level. Postsecondary vocational courses are classified at the upper secondary level, while postsecondary academic programs are classified as non-university or university education. The proportion of women with upper secondary education is likely to be relatively large due to the classification of a predominantly male population with apprenticeship qualifications at the lower secondary level. One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Netherlands

Classification is based on self-reported information, collected by means of a labor force survey, concerning the highest diploma or degree obtained in regular, as well as in adult, education.

Senior secondary vocational education is totally classified at the upper secondary level. A new scheme currently under development proposes to classify the 3- and 4-year programs as non-university higher education.

New Zealand

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Norway

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Portugal

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Sweden

The data are based on the national register of population and educational attainment, which contains information about issued certificates at the higher education levels. Around 20 percent of the classifications at the non-university level and 10 percent at the university and graduate school levels are based on self-reported information. Until 1968, persons who had passed an examination of a general program at the upper secondary level were awarded a diploma. The classification of persons educated at a later date is not based on diplomas but on the completion of the lower or upper secondary levels.

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Switzerland

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Turkey

Classification is based on the latest diploma or degree obtained. The preprimary level is excluded.

United Kingdom

Data are based on a labor force survey which does not include women older than 60 years of age because the female retirement age is 60. Therefore, the number of women 60 to 64 years of age and their educational attainment is estimated.

The upper secondary level (defined as beginning at about 14 or 15 years of age and lasting about three years) is interpreted for the United Kingdom as covering all persons with O level or A level examination passes, or their equivalent. Most vocational qualifications are included in the upper secondary level.

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

United States

Classification to levels of educational attainment is based on the highest level of education completed (or, the highest credential obtained), as specified by the 1990 U.S. Census response format, shown in Table S7:

Table S7

U.S. Census Bureau classification of levels of educational attainment: 1990

Level of educational attainment	Highest level of education completed
Preprimary-primary	8th grade or less
Lower secondary	9th grade to 12th grade (without a high school diploma)
Upper secondary	High school graduate
Non-university higher education	Associate degree (occupational or academic program)
University	Bachelor's degree or higher

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Technical Notes

Comparing educational attainment in the Current Population Survey and the 1990 Census of Population

The OECD's ***Education at a Glance*** (version 1991) is the primary source for country-level data on educational attainment and school enrollment in this report. U.S. numbers for all the educational attainment and school enrollment indicators in ***Education at a Glance*** came from the March, 1991 Current Population Survey (CPS) of the U.S. Census Bureau.

The Current Population Survey employed too small a sample, however, to give reliable estimates for most educational attainment and school enrollment indicators in the smaller of the U.S. states. Therefore, this report uses state estimates of educational attainment and school enrollment from the 1990 U.S. Census of Population. Though these estimates are a year older than the CPS estimates, they are reliable for every state — within acceptable margins of error.

Unfortunately, because the CPS and the Census *classified* students to levels of education very differently, they would appear awkwardly unmatched if used together in indicators in this report (as they would be if the U.S. total from ***Education at a Glance*** was employed in the same bar chart with Census-derived state estimates). The CPS assigned respondents to levels of education according to the number of years of schooling completed, whereas the Census assigned respondents to levels of education primarily according to diplomas or degrees completed.

The two tables below illustrate the problem. Table S8 presents the U.S. totals for educational attainment by level from the CPS for persons 25 to 64 years of age. Table S9 presents the same using the April 1990 Census as a source. The reader may note, among several other classification anomalies, that the non-university higher education level comprised 13 percent of the U.S. population 25 to 64 years old according to the CPS (Table S8), but 7 percent according to the Census (Table S9). The CPS was almost twice as large, and also may have been different in ways other than size.

Given these comparability problems, it was decided to use 1990 Census estimates for both the U.S. total and the state-level estimates in all the educational attainment and school enrollment indicators. This gives us older data for the U.S. (1990 rather than 1991), but superior comparability to the U.S. states without any loss of validity or reliability in the U.S. estimate.

Table S8

Educational attainment in the United States according to the Current Population Survey, by years of education: March 1991

Level of education/Years of education	Persons aged 25-64 (thousands)	Percent	Number of women (thousands)	Percent who are women
Preprimary-lower secondary: 11 years or fewer	21,536	17	10,730	50
Upper secondary: 12-13 years	60,196	47	32,496	54
Non-university higher education: 14-15 years	16,496	13	8,449	51
University: 16 years or more	30,376	24	13,986	46
TOTAL	128,604	100	65,661	51

SOURCE: U.S. Department of Commerce, Bureau of the Census, ***Educational Attainment in the United States: March 1991 and 1990***, Table 1.

Table S9

Educational attainment in the United States according to the decennial Census, by levels of education: April 1990

Level of education	Persons aged 25–64 (thousands)	Percent	Number of women (thousands)	Percent who are women
Preprimary–lower secondary: 12th grade or less; no diploma	24,726	19	12,286	50
Upper secondary: High school graduate or some college; no degree	64,912	51	34,526	53
Non-university higher education: Associate degree	9,038	7	4,957	55
University: Bachelor's degree or higher	28,952	23	13,144	45
TOTAL	127,629	100	64,913	51

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population, ***Education in the United States***, Table 1.

Classifying educational attainment by the 1990 Census' method imbues an "all-or-nothing" character to the measure. A person must fully complete a degree in an upper secondary, university, or non-university program in order to be counted at those levels. This classification method can give rise to some anomalous situations. Consider, for example, a person pursuing a bachelor's degree who has completed three years of a four-year program. In this classification scheme, that person would only have an upper secondary level of education, despite having completed more higher education coursework than most associate's degree holders.

It should come as no surprise, then, to see that the 1990 Census numbers are larger than the CPS numbers for lower levels of education and smaller for higher levels of education.

See the technical note to Indicator 8 for a discussion of CPS and Census comparability with regard to school enrollment measures.

Indicator 4: Note on GDP/GSP per capita

Notes on Figure and Tables

Purchasing Power Parity Indices (PPPI) were used to convert other currencies to U.S. dollars. Because the fiscal year has a different starting date in different countries, within-country Consumer Price Indexes (CPI) were used to adjust the PPPIs to account for inflation.

Australia

Fiscal year runs from July 1990 to June 1991.

Canada, Japan, United Kingdom

Calculated from 3/4 (1990) + 1/4 (1991).

Finland

Fiscal year is 1990.

New Zealand

Fiscal year runs from April 1990 to March 1991.

Sweden, United States

Calculated from 1/2 (1990) + 1/2 (1991)

United States

Due to the presence in the District of Columbia workforce of many who reside in the suburbs outside the District, the gross product of the District is abnormally large relative to its residential population. It is the size of its residential population, however, that more directly determines its educational expenditure.

Technical Notes

Gross domestic product is gross national product less net property income from abroad.

Estimation of 1991 gross products (GDPs and GSPs)

The OECD source document listed 1991 country GDPs in 1985 U.S. dollars. The BEA source document listed 1990 state GSPs in 1990 U.S. dollars. The 1991 country GDPs, then, were converted to 1990 U.S. price levels using implicit price deflators for gross domestic product in 1985 and 1990 in the ***Economic Report of the President***, January 1993. 1991 state GSPs were estimated from the 1990 GSPs per capita multiplied by the 1991 state populations.

Indicator 5: Note on percentage of population age 17 years or younger in poverty

Note on Figure and Tables

For all countries and states, "children" are persons 17 years of age and younger.

Technical Notes

Each country's data have been adjusted to fit the U.S. definition of poverty. A child is said to be in poverty if living in a household with an income less than 40 percent of its country's median income.

Income includes all forms of cash income plus food stamps and similar benefits in countries other than the United States. Income is adjusted using the U.S. Poverty Line Equivalence Scale. The ratio of the U.S. Poverty Line for a three person family to the adjusted median income was actually 40.7 percent in 1986. Thus, the 40 percent line is very close to the official U.S. poverty line. For further information, see Rainwater, Lee and Smeeding, Timothy M., "Doing Poorly: The Real Income of American Children in a Comparative Perspective" Working Paper No. 127, Maxwell School of Citizenship and Public Affairs, Syracuse University, August, 1995. See also Smeeding, Timothy M., "Why the U.S. Antipoverty System Doesn't Work Very Well," ***Challenge***, January-February, 1992, pp. 30-35.

Indicator 6: Note on births to teen mothers

Notes on Figure and Tables

For the European Community, births are recorded in the country of the mother's residence at the time of the birth, regardless of the actual location of the birth.

Births by age of mother are published in completed years for three countries (Greece, Ireland and the United Kingdom), and by the age reached in the calendar year for all others.

Technical Note

The method for converting rates by age in completed years into rates by age reached in the calendar year is described in G. Calot's *Measurement of rates in demographic studies — age in completed years or age reached during the calendar year. Impact of the choice of definition. Application to general fertility* (France, 1946–1981), INED, ***Travaux et Documents***, No. 104, 1984.

Indicator 7: Note on youth violent death rate

Technical Note

This indicator contains detailed statistics of deaths according to age and cause. Unless otherwise indicated, the data are official national statistics in the sense that they have been transmitted to the World Health Organization (WHO) by the competent authorities of the countries concerned. The statistics are based on the concept of the underlying cause of death, defined as "the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury" (***Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death, Ninth Revision** (1975)*. Geneva, WHO, 1977. (Vol. 1, p. 763).

Indicator 8: Note on participation in formal education

Notes on Figure and Tables

Germany (West)

The data reflect the high proportion of students who enroll in a second program at the upper secondary level after having taken a first diploma at this same level.

Netherlands

Two small adjustments have been made since the first edition ***Education in States and Nations***: special education, which was formerly allocated to the primary level has now been distributed over the primary and secondary levels; and certain categories of students in universities are allocated to the graduate school level.

Spain

Some aspects of classifying educational programs by education levels have been changed since the first edition of ***Education in States and Nations**:* foreign language courses are classified as part-time education at the upper secondary level; and all vocational programs have been excluded from the lower secondary level, so that only the compulsory programs are now taken into account at this level.

Switzerland

Enrollment rates do not include special education at the primary and secondary levels (about 1.6 percent of the population 5 to 29 years of age and 5.1 percent of enrollments at those levels).

Technical Notes

Calculation of full-time equivalent enrollments

In calculating the indicators on per-student expenditure and participation rates, all part-time enrollments are converted into full-time equivalents (FTE). With some exceptions, the INES Secretariat has calculated full-time equivalents using the following convention:

- Preprimary–secondary levels, one part-time enrollment equals one FTE enrollment.
- Higher education levels, two part-time enrollments equal one FTE enrollment. (For the United States, three part-time enrollments equal one FTE enrollment.)

Comparing school enrollment in the Current Population Survey to the same in the 1990 Census of Population

The OECD's ***Education at a Glance (EAG)*** (version 1991) is the primary source for country-level data on educational attainment and school enrollment in this report. U.S. numbers for all the educational attainment and school enrollment indicators in ***EAG*** came from the March, 1991 and October, 1990 Current Population Surveys (CPS) of the U.S. Census Bureau, respectively.

However, the Current Population Survey employs too small a sample to give reliable estimates for most educational attainment and school enrollment indicators in the smaller U.S. states. Therefore, this report uses state estimates of educational attainment and school enrollment from the 1990 U.S. Census of Population. Though these estimates are a year older than the 1991 estimates used in EAG with which we wished to compare, they are reliable for every state — within acceptable margins of error.

Unfortunately, because the CPS and the Census *classify* students to levels of education differently, they would appear awkwardly unmatched if used together in indicators in this report (as they would be if the U.S. total from *EAG* was employed in the same bar chart with Census-derived state estimates). Among other differences, the CPS is primarily designed to estimate educational attainment levels, not enrollment levels. The March CPS classifies the population into levels of education based on the highest level of education *completed* rather than according to the grade level in which a student is currently enrolled. It is in some cases with the CPS data, then, difficult to know at what grade level a student is currently enrolled. The Census, however, classifies students according to the grade level in which the student is currently enrolled.

Given these comparability problems, it was decided to use 1990 Census estimates for both the U.S. total and the state-level estimates in all the preprimary through secondary school enrollment indicators (higher education enrollments come from the IPEDS data base). This provides older data for the U.S. (1990 rather than 1991), but superior comparability to the U.S. states without any loss of validity or reliability in the U.S. estimate.

See the technical note to Indicators 3, 21, 22, 26, 27, and 28 for a discussion of CPS and Census comparability with regard to educational attainment measures.

Note on enrollment reference groups

See note on pp. 233–236.

Indicator 9: Note on enrollment in preprimary education

Notes on Figure and Tables

Canada

The coefficient for full-time equivalence is equal to 2, while for all other countries it is equal to 1. That is, two preprimary enrollments are counted as one full-time equivalent enrollment.

Czechoslovakia

The theoretical age range for preprimary education is from 3 to 5 years, but some 6 year-olds are also enrolled, because they were born after September 1st, when the school year for primary education starts. Children from 6 months until 3 years of age can be in child-care programs organized under the auspices of the Ministry of Health.

Finland

The figures cover all 6-year-olds receiving full-time child care in kindergartens and all 6 year-olds participating in preprimary education in comprehensive schools.

France

Official participation rate is higher than 100 percent (101.3 percent) for 4-year-olds because there more registered pupils than children according to the official statistics from INSEE.

Ireland

Preprimary education is part of the primary school system. Data on enrollment at this level relate to education provided in infant class grades within primary schools. These cater in the main to children between 4 and 6 years of age. Over 50 percent of children aged 6 — the age at which compulsory schooling begins — are still enrolled in infant classes. Data on institutions engaged in child care and the development of children before the age of 4 are not generally included.

Netherlands

The data refer strictly to preprimary education for 4- and 5-year-olds. Preprimary education is fully integrated with primary education, although it is only partially compulsory. Data concerning the participation of children in child-care centers, creches, nurseries, and similar programs have not been provided.

Spain

Official participation rate is higher than 100 percent (100.3 percent) for 5-year-olds because there are more registered pupils than children according to demographic projections from INES.

Sweden

The integrated preschool system makes it very difficult to draw a line between daycare and preprimary education. The figures, therefore, only include that part of total participation that is mandatory for the municipalities to supply: preprimary education for 6-year-olds.

Switzerland

In some cantons, the theoretical starting age is 4 years. Ninety-eight percent of the children entering the first year of primary education have been enrolled in a preschool institution during at least one year.

United Kingdom

Age 3 enrollment includes age 2 enrollments.

Technical Notes

Calculation of full-time equivalent enrollments

In calculating the indicators on per-student expenditure and participation rates, all part-time enrollments are converted into full-time equivalents. With one exception (Canada), the INES Secretariat has calculated full-time equivalents using the following convention:

Preprimary–secondary levels: one part-time enrollment equals one full-time enrollment.

Adjustment of preprimary education enrollment rates for U.S. States

There exist two inconsistencies between the Census Bureau's Current Population Survey (CPS) estimates for preprimary enrollment by age (which provided the U.S. figure in the OECD's ***Education at a Glance***) and the 1990 Census of Population and Housing estimates (which provide the basis for the state figures). The first derives from the differing administration times of the two surveys — the CPS on or about October 1 and the Census on or about April 1. The second derives from differences in the wording of the pertinent questions that seem to elicit differing responses regarding enrollment status.

The effect of differing administration times is to lower the April Census enrollment rates for ages 3, 4, and 5 below the October CPS rates and to raise the Census rate for age 6 above the CPS rate. This is because, between October 1 and April 1, about half of the children increase in age while most remain in the same enrollment status, either in or out of preprimary school. Typically, children start in nursery school at the beginning of the academic year — in the fall — at the age at which they are eligible and their parents believe them to be ready. If all students starting the fall semester in the first-year cohort at a nation's or state's nursery schools were 3-years-old, about half would turn 4 by April 1. Therefore they would show up as 4-year-olds in the April Census and as 3-year-olds in the previous October's CPS.

Because preprimary enrollments increase with age, this "age creep" between the October CPS and the April Census produces larger enrollment rates in the CPS than in the Census for ages 3, 4, and 5.

At age 6, an age where most children leave preprimary for primary school, the relationship between the CPS and Census numbers reverses — the April Census numbers exceed the October CPS numbers. This is because many students who started in a preprimary grade in the Fall semester, because they were 5 years old at the time, turn 6 before the April Census.

The second inconsistency between the CPS and the Census figures derives from differences in the wording and sequencing of the questions regarding preprimary enrollment. The effect is to reduce at every age the enrollment rates in the Census by comparison with those in the CPS.

The reason for using the April Census numbers at all, given the need to adjust them, is that they emanate from a very large sample (about 5 percent of U.S. households) while the CPS numbers do not. The CPS state-level samples are large enough to be judged reliable in only about 19 states. The October, 1990 CPS-derived preprimary enrollment rates for the ten largest of those states and the standard errors are presented in Tables S10 and S11 below.

Table S10

Enrollment in public and private preprimary education, by age and state: October 1990

State	Age			
	3	4	5	6
California	28.2	53.0	85.2	10.3
New York	43.2	58.1	79.5	5.3
Texas	23.4	55.2	89.7	22.4
Florida	34.2	61.5	88.9	12.9
Pennsylvania	38.0	67.3	87.0	17.8
Illinois	36.3	54.4	88.9	22.9
Ohio	29.3	55.2	90.9	14.2
Michigan	35.0	68.5	91.8	16.3
New Jersey	48.7	65.8	95.0	10.8
North Carolina	39.3	47.7	85.2	13.2
UNITED STATES	32.6	56.0	88.8	16.6

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 1990.

Table S11

Standard errors for estimates in Table S10

State	Age			
	3	4	5	6
California	3.5	3.7	2.7	2.5
New York	5.0	5.1	4.4	2.4
Texas	4.8	5.3	3.0	4.3
Florida	6.3	6.0	3.9	4.0
Pennsylvania	6.4	6.0	4.4	5.5
Illinois	6.6	6.6	4.0	5.1
Ohio	6.2	5.8	3.5	4.3
Michigan	6.2	6.8	3.7	5.1
New Jersey	9.3	8.3	4.0	5.3
North Carolina	9.4	10.2	6.7	6.3
UNITED STATES	1.1	0.9	0.9	0.9

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 1990.

Adjustments have been made to the 1990 Census-derived preprimary enrollment rates in the 50 states and the District of Columbia as follows:

1.) A regression equation for each age was designed with the following form:

$A = \chi_1 + \chi_2 B$

A = CPS-derived enrollment rate (October 1990)
B = Census-derived enrollment rate (April 1990)
χ_1 = constant (arithmetic adjustment)
χ_2 = slope of the relationship (proportional adjustment)

2.) The regression was run on the data from the 19 states with CPS estimates derived from samples large enough to give reliable state estimates. The regression run produced estimates for χ_1 — constant in the equation and the arithmetic adjustment factor between the Census and CPS estimates — and for χ_2 — the slope of the relationship and the proportional adjustment factor between the Census and CPS estimates. The four regression runs produced the output shown in Table S12.

Table S12

Output from regression of October 1990 CPS preprimary enrollment rates onto April 1990 Census preprimary enrollment rates

Age	Constant (χ_1)	Standard error	Slope (χ_2)	Standard error
3	23.756	5.983	0.567	0.356
4	26.156	9.984	0.863	0.364
5	88.115	4.861	0.028	0.230
6	-12.301	6.261	1.269	0.259

The two factors — χ_1 and χ_2 — were then used to adjust the Census estimates for enrollments in all 50 states and the District of Columbia. These adjusted enrollments are listed in Table 9a for the United States, and in Table 9b for the states, and are displayed in Figure 9.

Indicator 10: Note on secondary education enrollment

Notes on Figure and Tables

Czechoslovakia

Specialized secondary education is included in general secondary education because the students in vocational and technical schools also receive general education.

Denmark

The students in secondary and higher education are generally much older than in Central and Southern European countries and in North America. The enrollment rates for higher education, for example, are higher at the age of 25 than at the age of 20.

France

Participation rates do not include special education, which is classified as ungraded.

Ireland

The data have been influenced by the use of population figures for 16, 17 and 18 year-olds, which were based on estimates supplied to OECD prior to the publication of the final results of the Census of Population for 1991. The revised population totals for these age groups indicate rates of participation in secondary education (males and females) of 88.6, 67.5 and 30.1 percent for 16-, 17- and 18-year-olds, respectively, by comparison with the 85.1, 64.7 and 28.8 percent one finds in the text.

Japan

Students enrolled in upper secondary courses offered by the Special Training Colleges (about 100,000 students in the relevant age group) are not included.

Spain

Participation rates do not take into account either the students enrolled in special education (classified as ungraded), or children whose age is unknown (about 1.3 percent of full-time enrolled students).

Switzerland

Participation rates do not take into account special education at the lower secondary level (4.7 percent of 14-year-olds, 4.0 percent of 15-year-olds and 2.1 percent of 16-year-olds).

Technical Notes

Calculation of full-time equivalent enrollments

See technical notes for Indicator 8.

Contrast between Census- and Current population survey-derived estimates of secondary education enrollment rates

There exist two inconsistencies between the Census Bureau's Current Population Survey (CPS) estimates for secondary education enrollment rates (which provide the U.S. figure in the OECD's ***Education at a Glance***) and the 1990 Census of Population estimates (which provide the basis for the state figures used here). The first derives from the differing administration times of the two surveys — the CPS on or about October 1 and the Census on or about April 1. The second derives from differences in the wording of the pertinent questions that seem to elicit differing responses regarding enrollment status.

The effect of the differing administration times is to raise the April Census enrollment rates above the CPS rates in the older age cohorts (16 and above), when some teens start to drop out of school. This is because many students who started in a secondary grade in the fall semester when they were age x, turn age x+1 before the April Census.

For example, at age 15, enrollment is still virtually universal. Thus, the October CPS shows an enrollment rate for 15-year-olds close to 100 percent. Likewise, the April Census shows enrollment rates in the mid-to-upper nineties for 15-year-olds. But, the enrollment rates drop off for 16-year-olds, to a greater degree in the CPS numbers than in the Census numbers. That's because about half of the 16-year-olds in the Census figures are, in all likelihood, a grade level below about half of the 16-year-olds in the CPS estimate. Students in the same age cohort, then, are, on average, at a lower grade level in the Census than they are in the CPS.

For comparison purposes, the October 1990 CPS secondary education enrollment rates and the standard errors are presented in Tables S13 and S14 below for the 10 largest states.

Table S13

Enrollment in public and private secondary education, by age and state: October 1990

State	Age							
	14	**15**	**16**	**17**	**18**	**19**	**20**	**21**
California	100.0	99.0	95.8	79.6	22.6	5.2	2.0	2.3
New York	99.3	97.3	96.5	85.1	34.5	9.1	1.4	0.9
Texas	99.1	98.1	100.0	89.1	37.7	8.3	1.4	2.1
Florida	100.0	96.9	95.9	84.8	23.7	8.1	0.0	3.1
Pennsylvania	98.6	96.6	99.0	90.6	19.3	2.2	1.2	1.4
Illinois	100.0	98.4	96.4	80.8	19.9	9.4	0.0	2.6
Ohio	98.8	97.5	96.9	93.1	19.5	5.3	0.0	0.0

State	Age							
	14	15	16	17	18	19	20	21
Michigan	100.0	96.1	93.7	83.5	30.6	4.9	3.8	0.9
New Jersey	100.0	97.6	95.8	83.4	27.6	1.9	1.2	0.0
North Carolina	100.0	99.0	94.2	88.0	16.8	5.1	0.0	0.0
UNITED STATES	99.4	98.3	95.3	84.6	23.6	6.0	1.3	1.1

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October, 1990.

Table S14

Standard errors for estimates in Table S9

State	Age							
	14	15	16	17	18	19	20	21
California	0.0	0.8	1.7	3.2	3.4	1.8	1.0	1.1
New York	0.8	1.8	1.9	3.9	5.0	2.8	1.2	0.9
Texas	0.9	1.5	0.0	3.4	5.2	2.7	1.1	1.4
Florida	0.0	2.1	2.5	5.1	5.4	3.2	0.0	2.4
Pennsylvania	1.7	2.3	1.3	4.1	4.6	1.7	1.4	1.5
Illinois	0.0	1.8	2.5	4.5	4.9	4.1	0.0	2.0
Ohio	1.4	1.8	2.2	3.4	5.1	2.6	0.0	0.0
Michigan	0.0	3.0	3.6	4.9	6.3	2.9	2.5	1.3
New Jersey	0.0	2.4	3.2	6.2	7.1	2.0	1.7	0.0
North Carolina	0.0	1.7	4.2	4.9	5.9	3.5	0.0	0.0
UNITED STATES	0.0	0.0	0.0	0.0	1.1	0.6	0.3	0.3

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October, 1990.

Adjustments have been made to the 1990 Census-derived enrollment rates at each age in the 50 states and the District of Columbia as follows:

1.) A regression equation was designed with the following form:

$$A = \chi_1 + \chi_2 B$$

A = CPS-derived enrollment rate (October 1990)
B = Census-derived enrollment rate (April 1990)
χ_1 = constant (arithmetic adjustment)
χ_2 = slope of the relationship (proportional adjustment)

2.) The regression at each age was run on the data from the 19 states with CPS estimates derived from samples large enough to give reliable estimates. The regression run produced estimates for χ_1 — constant in the equation and the arithmetic adjustment factor between the Census and CPS estimates — and for χ_2 — the slope of the relationship and the proportional adjustment factor between the Census and CPS estimates. The eight regression runs produced the output shown in Table S15.

Table S15

Output from regression of October 1990 CPS secondary enrollment rates onto April 1990 Census secondary enrollment rates

Age	Constant (χ_1)	Standard error	Slope (χ_2)	Standard error
14	199.424	0.575	-1.036	0.462
15	19.580	1.407	0.826	0.534
16	111.913	6.359	-0.188	1.120
17	55.280	7.374	0.372	0.415
18	13.477	7.146	0.283	0.369
19	2.768	3.658	0.446	0.766
20	0.038	1.217	0.424	0.487
21	-0.595	1.102	1.211	0.544

The two factors — χ_1 and χ_2 — were then used to adjust the Census estimates for enrollments in all 50 states and the District of Columbia. These adjusted enrollments are listed in Table 10a for the United States, in Table 10b for the states, and displayed in Figure 10.

Indicators 11, 12, and 13: Note on entry ratio to higher education, and university and non-university higher education enrollment

Notes on Figures and Tables

Denmark

The students in secondary and higher education are generally much older than in Central and Southern European countries and in North America. The enrollment rates for higher education, for example, are higher at the age of 25 than at the age of 20.

Finland

The figures comprise both new entrants into higher education-level programs and persons who have previously been enrolled at this level.

France

The preparatory classes for the *Grandes Écoles* are classified at the university level.

Hungary

Data include participation in all colleges that offer 3- or 4-year programs leading to a special college degree in several fields.

Data refer to participation in universities which offer 4- or 5-year programs leading to a university degree. Colleges of Arts are not included here but in the non-university higher education level because of technical reasons. There is no figure for the graduate-school level because doctoral programs have been organized by separate research institutes, not by universities. Universities offer post-graduate courses only for adults who return to education after having gained work experience.

Ireland

The data have been influenced by the use of population figures for 18 year-olds, which were based on estimates supplied to OECD prior to the publication of the final results of the Census of Population for 1991. The revised population totals for this group indicate a ratio of new entrants to higher education (full-time) of 35.3 percent, by comparison with the 33.8 percent in the text.

Netherlands

The figure for higher education does not correspond to the sum of the figures for non-university higher education and university education because the total for new entrants excludes new entrants into university higher education who previously entered non-university higher education or other university programs, and vice versa.

Spain

Figures include a small proportion of new entrants who were previously enrolled in universities.

United Kingdom

New entrants are home students only (figures on new entrants from overseas are not available).

United States

Source for the U.S. country-level entry-ratio figure in Indicator 11 is the Integrated Postsecondary Education Data System's (IPEDS) Fall Enrollment survey, and not the OECD's INES Project. Overestimation had occurred in the U.S. country-level figure sent to INES because the figure included *all* new entrants, not just *first-time* entrants. Thus, students re-starting their education program after an extended leave were included in the U.S. country figure. For the U.S. states, with their figures drawn from the IPEDS, however, all new entrants were indeed, "first-time freshman." There's no overestimation problem with the figures used here, because both the U.S. and the state figures come from the same source, the IPEDS.

Age-specific enrollment data for the United States and the U.S. states contain some proportion of students of unknown age — 10 to 15 percent for non-university higher education and less than 5 percent for university higher education. These students are apportioned over all the age levels according to the proportion of total enrollment that each age level has.

Due to the presence of several large, private universities in the District of Columbia that draw students primarily from outside the District, the participation ratio for the District may be misleading. Many of the enrolled students either live outside the District and are not counted in the age-range population, or moved to the District solely for the purpose of attending school.

Technical Notes

Non-inclusion of proprietary schools

In the United States and some other countries, educational institutions exist that operate for profit, offering focused educational programs that lead to specific vocational certificates, usually in periods of less than two years. These institutions are excluded from education data for the United States, and for some other countries as well.

Calculation of full-time equivalent enrollments

See technical notes for Indicator 8.

Note on enrollment reference groups and entry reference ages

See note on pp. 233-236.

* * *

Indicator 14: Note on staff employed in education

Notes on Figure and Tables

Australia, Finland

Staff are underestimated because staff in institutions consisting of preprimary grades only are not taken into account.

Denmark

The figures are estimates. Teaching staff at continuation schools are included in other staff.

Germany (West)

The apprentice teachers — i.e. the staff responsible for the teaching of apprentices in the enterprises under the dual system — are not included among the teaching staff.

United States

The figures are underestimated because they do not include teachers in schools that have only preprimary childhood classes. Many of the schools included here offer both preprimary (i.e., pre-kindergarten and kindergarten) and primary levels of education.

State-level figures are available for private school teachers, but not for non-instructional staff. Non-instructional staff for private schools were estimated using a national teacher-to-non-instructional staff ratio for private schools.

Indicator 15: Note on number and size of schools

Notes on Figures and Tables

All countries

Schools and students are counted at the preprimary level if they are considered to be in education programs. Generally, programs called "kindergarten" or "nursery school" are included, whereas programs called "daycare" are not.

Special education schools are excluded at the preprimary-secondary level, except where noted, but special education students are included if they attended regular schools.

Vocational-technical colleges are included, but worksite programs, technical training centers, and apprenticeship programs and their students are not. Further education, adult education, and correspondence programs also are excluded, except where noted.

Generally, free-standing art and music schools are excluded at the primary-secondary level (because it is not clear that their students attended these schools exclusively), but included at the higher education level where it is clear that the institutions were free-standing institutions, separate from universities.

Higher education enrollments are headcounts. Thus, part-time students are counted as equivalent to full-time students.

Australia

Special education schools and students are included, as there was not enough information in sources by which to separate them out.

Technical and Further Education (TAFE) schools are considered to be higher education.

Sources: Australian Bureau of Statistics, ***Schools Australia***, 1992, Table 2. APEC. UNESCO.

Belgium (French Community)

L'enseignment artistique (ex: académie de musique) et l'enseignment de promotion socio-culturelle excluded.

Source: *Service des Statistiques*, ***L'Enseignement en Chiffres 1990-91***, 1991.

Canada

At elementary-secondary level only, private schools and their students are excluded.

Sources: Canadian Education Statistics Council, ***A Statistical Portrait of University-Level Education in Canada*** (see particularly Annexes 1, 2, and 3); ***A Statistical Portrait of Elementary and Secondary Education in Canada***, 1992, Table 6. APEC. UNESCO.

Finland

Students in vocational schools can be secondary or higher education students. The number of vocational schools have been divided here between those two levels of education, then, based on their relative proportion of enrollments: two-thirds secondary and one-third higher education. Apprentices, however, are excluded from the counts.

Source: Statistics Finland, ***Education in Finland 1994: Education Statistics and Indicators***, 1994, tables 3.3 and 3.6, pp. 20-24.

France

Includes *France Métropolitaine* only. Most students who might be categorized as special education students in other countries are taught in regular schools in France and counted there.

Excludes classes of the CPGE and STS, which are postsecondary programs of additional preparation for admission to the *grand écoles* (the CPGE) and technical training (the STS).

Classes in these programs are typically conducted in *lycées*. Also excluded are schools and enrollments at *écoles paramédicales et sociales* (enrollment=70,385) and *"autres établissements d'enseignment supérieur"* (enrollment=103,596), including teacher training schools. Not considering the CPGE and STS, about 82 percent of French higher education students are included here. If one were to classify the CPGE and STS as higher education programs, then about 70 percent of French higher education students are included here.

Higher education institutions and enrollments included here, then, include universities, *écoles d'ingénieurs, écoles de commerce, gestion, et comptabilité*, and their students.

Sources: *Ministère de l'Éducation Nationale et de la Culture*, ***L'Éducation Nationale en Chiffres, 1991-92***, 1992; ***Repères & Références Statistiques sur les Enseignment et la Formation***, 1992, pp. 16-17, 22-23, 26-27, 30-31, 34-35, 50-51, 64-65, 130-131, 138-141. UNESCO.

Germany

Sources: *Der Bundesminister fur Bildung und Wissenschaft*, ***Grund-Und Strucktur Daten***, 1992-93, pp.44-45, 154-155, 167. UNESCO.

Japan

Special Training Schools, Miscellaneous Schools, and the University of the Air are excluded, but correspondence students at regular higher education institutions are counted. Non-university institutions consist of colleges of technology and junior colleges.

Sources: Ministry of Education, Science and Culture, ***Monbusho***, 1989, p.17. Ellen E. Machiko, ***A Study of the Educational System of Japan and a Guide to the Academic Placement of Students in Educational Institutions of the United States***. Washington, D.C.: American Association of Collegiate Registrars and Admissions Officers, 1989. APEC. UNESCO.

Korea

Number of universities includes 298 graduate schools. Miscellaneous Schools are excluded.

Sources: Ministry of Education, ***Education in Korea, 1990***, 1991, p. 11. APEC. UNESCO.

New Zealand

Includes those students enrolled in preprimary programs at primary schools as well as those in physically separate kindergartens. Excludes subsidized supervised playgroups, childcare services, playcentres, and Kohanga Reo. Includes three primary-level and 2 secondary-level special education schools.

Sources: Ministry of Education, ***New Zealand Schools, 1993***, 1994, Table 1. APEC.

Spain

Students and schools involved in the Experimental Postsecondary Education Reform program are excluded. Arts and Language schools and students (primary-secondary level) are excluded.

Sources: *Ministerio de Educación y Ciencia*, ***Informe Nacional de Educación***, 1992, Tables 1.2, 1.13, 1.14 and 1.15 on pp. 26, 37, 38. UNESCO.

Taiwan

Supplementary Schools are excluded.

Source: Ministry of Education, Bureau of Statistics, ***Education in the Republic of China***, 1992, pp. 33 and 37. APEC.

United Kingdom

Includes "non-maintained" independent and direct-grant schools (N=2,488), including a small number of independent special education schools [public sector special education schools (N=1,792) and their students (N=112,600) are excluded]. All "non-maintained" schools here comprise the preprimary-secondary combined category. Includes Open University students counted as part-time students.

Excludes independent nursery schools having less than 5 pupils of compulsory school age. Excludes further education.

Source: Government Statistical Service, ***Education Statistics for the United Kingdom***, 1993, Table A.

United States

Preprimary-primary schools (a.k.a. elementary schools) begin with grade 6 or below and end with no grade higher than 8. Secondary schools' category includes schools with no grade lower than 7. Thus, most middle schools (grades 6-8) would be classified as primary, whereas most "junior high schools (grades 7-9)" would be classified as secondary.

Data are available by state from fall 1991 only for the total number of private preprimary-secondary schools. Private school numbers are then allocated across the three categories of preprimary-primary, secondary, and combined according to the allocation ratio in each state for the public schools.

Technical Notes

Problems in comparing the number of schools and their sizes across countries

There exists some variation in how countries count students and schools, and which students and schools they count, that creates problems in comparing school sizes. The variation tends to arise chiefly at the "borderlands" of education.

The borderlands include: preprimary education and daycare, special education, adult education, vocational and technical education, correspondence programs, and private schools.

Some countries, for example, simply do not consider private "center-based" daycare to be education. Indeed, in some countries, even public center-based daycare is not managed by education authorities; rather, it is the responsibility of human services departments. Programs outside the purview of the education authorities tend not to have good statistical accounting in data collections managed by public education authorities.

The exact location of each "boundary" between level and types of education also varies from country to country and even within each country. In Canada, for example, vocational-technical students in Québec who so choose enter vocational-technical college in the 12th grade. In the other Canadian provinces with vocational-technical colleges, entry is at the 13th or the 14th grade. Thus, vocational-technical students in the other provinces spend more time at the upper secondary level. The more time the average student spends in a level of education, the greater will be the number of students at that level. This can affect school size.

In order to improve comparability in the school size statistics, the following decisions have been made with regard to the data:

- Countries are excluded if the exact number of schools and students could not be determined at each level. One must be particularly careful not to double count schools. A typical country education statistical table displays the number of schools and students for each level of education. Not all of the schools listed may be separate, however. The best statistical tables, for the purpose of the construction of this indicator, provide separate counts both for schools that are unique to a level of education and for those that combine levels.

- Programs are excluded if it could not be determined precisely how to allocate students and schools between levels of education. This issue arises particularly with vocational-technical programs, which straddle the secondary and higher education levels in some countries, not wholly in one level or the other.

- Each country's own definition for which grades or age-groups comprise the different levels of education have been accepted, because countries count their students and schools within their own classification systems. It should be remembered, though, that the break point between levels of education varies across countries and even within countries. Thus, in comparing two countries' by a particular level of education, one may actually be comparing two different grade-level groups or age groups. For an explicit exposition of the variation in levels of education across countries, see Table S1.

- Only those programs that each country considers to be "education" programs have been counted. This issue arises particularly with preprimary programs. What one country labels "center-based daycare" might not look any different in practice from what another country labels "nursery school." But, it was beyond the scope of this project to investigate the content of preprimary programs across countries in much detail. At one extreme, France runs its *écoles maternelles* through their education ministry, which enroll *most* children from aged 3 through 5, and also enroll many 2-year-olds. At the other extreme, some Canadian and Australian provinces have no programs identified as preprimary education (most other Canadian and Australian provinces provide a year of kindergarten in their elementary schools).

- For similar reasons, worksite programs, technical training centers, and apprentice programs and their students are excluded. Further education, adult education, and correspondence programs also are excluded. Reliable comparable data for such programs would be very difficult to uncover. In many cases, country education authorities would not have them.

- Where possible, free-standing special education schools are excluded, because some countries do not count them as part of their "education" statistics, whereas others do. Moreover, double-counting could emerge as a problem if students spend part of their time at a regular school and the other part at a special school. One could encounter the same problem with primary–secondary level art and music schools, and for the same reason, they have been excluded as well. Moreover, double-counting could be a problem with apprentice programs if students are counted once at their regular school and then again at their worksite.

Comparing the elementary-school model to the preprimary-school model

There exist two basic grade-level structures for the preprimary grades, one that adds preprimary grades onto existing elementary schools, and the other that employs separate preprimary schools. In the elementary-school model, a school system might expand into the preprimary grades by, first, adding a year of kindergarten and then, perhaps, a year of prekindergarten. In the preprimary-school model, a school system might build from scratch or convert existing daycare programs to nursery schools with explicit academic instructional components.

A country's expansion of education into the preprimary years within the elementary-school model has the potential for making larger schools, since existing elementary schools are simply adding new grade-levels. A country's expansion of education into the preprimary years within the preprimary-school model has the potential for adding more schools and, probably, reducing average school size, because preprimary (or, nursery) schools tend to be smaller than schools at other levels of education.

Countries in which the elementary-school model predominates include Australia, Canada, and the United States. Countries in which the preprimary-school model predominates include Belgium, France, Japan, Korea, Spain, and the United Kingdom. Other countries — Finland, Germany, New Zealand, and Taiwan — employ a mix of the two models, though the preprimary-school model is more popular in each of them. In Taiwan, the public preprimary programs tend to be attached to public primary schools and, thus, in the elementary-school model. The far more numerous private preprimary programs in Taiwan, however, are separate from primary schools.

Preprimary programs have been included here for two reasons: it is not always possible to separate out preprimary students from elementary-school student counts; and one wouldn't want to separate them out, anyway, because they are students who add to the size of the school. Subtracting them from the school population would give one an inaccurate measure of the size of the school.

Problems in calculating the number and size of higher education institutions: branch campuses

Generally, graduate school students are included in the counts of university students. They would only be counted separately if they studied in schools that were separate.

Exactly what constitutes institutional separateness in higher education, however, is open to dispute. Consider the problem of branch campuses. At what stage of existence does a branch campus become a separate institution? Take, for example, the University of California — one university with several campuses. The two most prominent campuses of the University are at Berkeley (UCal), nominally the "main" campus, and at Los Angeles (UCLA). Legally, these are two branches of the same university, but in many meaningful ways they function as separate universities.

If one were to count UCal and UCLA as separate universities, however, what of all other University of California programs that happen to be geographically separate, for example, the nuclear weapons research facility at Los Alamos, New Mexico, which has no students, classrooms, or teachers? One could, perhaps, explicitly require that, in order to be classified as a higher education institution, a facility must have students, classrooms, and some full-time professors with offices on site. But, even that definition could suffer some slippage in clarity. Besides, examining the individual characteristics of different countries' many higher education institutions in such detail is beyond the scope of this report.

In this report, then, universities are counted as their countries count them. For the United States' data included here, every 4-year degree-granting higher education institution is counted separately, main and branch campuses alike. (And, UCLA and UCal are counted as two separate universities.)

In most countries, universities are single institutions that exist in only one place. Branch campuses, and the comparability problem they portend for this indicator, seem to be largely a U.S. phenomenon. For those who would prefer that branch campuses should not be counted, the U.S. average higher education institution size calculated here will seem too low, but the school sizes for all the other countries would still be comparable.

Problems in calculating the number and size of higher education institutions: headcount versus full-time-equivalent enrollment counts

Another education statistics comparability problem — that of headcount versus full-time-equivalence (FTE) enrollments — presents only a minor problem at the preprimary–secondary level, but could represent a major problem at the higher education level. A headcount enrollment counts every student as one student regardless of the level of participation. Theoretically, a student who takes one hour a week of class at a university could be counted as one student just as a full-time student, taking fifteen hours a week of class would be. In practice, however, some education authorities impose a minimum participation threshold on the numbers in order to not count the most casual students. All students participating, say, at least half-time, might get counted as students in the head count.

Full-time equivalency would count some or all part-time students not as individual students, but as partial students, their weight in the count determined by the degree of their participation in school. A half-time student would get counted as a 0.5 student rather than 1. A quarter-time student would get counted as a 0.25 student, and so on. FTE counts give a more accurate picture of the size of an institution as it is practically being used.

Full-time-equivalent counts are usually lower than headcounts at the same institution. The two methods of counting would only produce the same number at an institution in which all students were full-time. It is not possible that an FTE count could be higher than a headcount if the same students at the same institution were being counted.

For this indicator, we use headcounts. That is because all but three of the countries for which we have data publish headcounts exclusively. Canada, New Zealand, and the United States however, did publish their numbers of part-time students along with their full-time numbers. Counting the part-time students as 0.5 students, we can calculate a FTE enrollment for these countries. Table S16 displays these FTE enrollments for the average higher education institution in each country, next to the equivalent headcount enrollment.

As Table S16 shows, using FTE enrollments rather than headcounts does not affect the relative ranking of school sizes across these three countries, but it is conceivable that it could make a difference with a larger sample of countries. Part-time students make up a larger proportion of the student population in the United States than in Canada or New Zealand, for example. The proportion of part-time students in a student population may vary across other countries as well, and, so long as it does, the two different accounting methods — headcount and FTE — can produce different school size rankings.

Table S16

The average size of higher education institutions, by counting method and country: Various years

	Average number of students per institution of higher education...	
Country	**...using a headcount enrollment**	**...using a full-time equivalent enrollment**
Canada	3,769	3,063
New Zealand	3,737	3,026
United States	3,988	3,120

Indicators 16, 17, 18, 19, and 20: Note on class size, student use of technology, student time spent doing homework or watching television, instructional strategies in mathematics courses, and time in formal instruction

Notes on Figures and Tables

Brazil

In-school population only was sampled in two cities, São Paulo (in the South) and Fortaleza (in the Northeast).

Canada

Nine of ten provinces participated.

Emilia-Romagna, Italy; Portugal; Scotland

Combined school and student participation rate was below 80 percent but at least 70 percent; interpret results with caution because of possible nonresponse bias.

England

Combined school and student participation rate was below 70 percent; interpret results with extreme caution.

Israel

Hebrew-speaking schools.

Soviet Union

Fourteen of fifteen republics; Russian-speaking schools only.

Spain

All regions except Cataluña. Spanish-speaking schools only.

Switzerland

Results represent percent of classrooms in schools; fifteen of twenty-six cantons included.

United States

The U.S. sample for the International Assessment of Educational Progress (IAEP) consisted of both public and private schools. Only 13-year-olds were included.

The state samples for the National Assessment of Educational Progress (NAEP), on the other hand, consisted of 8th grade classrooms only in public schools.

On average, students in the state samples were likely older than those in the U.S. sample.

Technical Notes

Calculation of class size

School administrators in schools participating in the International Assessment of Educational progress were asked the modal class size for the grade level to which most 13-year-old students were assigned. This class size refers to all academic subject areas, not just mathematics.

Data for the U.S. states do not include special education teachers.

Calculation of instructional hours per day for the U.S. States (Indicator 20)

The base estimates of school hours per day for the U.S. states come from the 1990-91 Schools and Staffing Survey. These estimates, however, include lunch hours and breaks. The estimate of *instructional* hours per day for the United States as a whole comes from the International Assessment of Educational Progress and includes only instructional hours. Formal instruction is that which takes place, generally in a classroom, between a teacher and a set group of students on a regularly scheduled basis.

In order to convert state-level school hours to instructional hours, the state-level estimates were totalled and averaged. That all-states average of school hours per day (6.5) had subtracted from it the U.S. estimate of instructional hours per day (5.6). The difference (.9 hours) was taken to be the amount of time on average, encompassed by lunch time and breaks. The difference was subtracted from each state's estimated school hours per day to arrive at an instructional hours per day figure for each state.

These figures were then checked against the state requirements for minimum length of the instructional school day, and all appeared equal to or greater than the minimums.

The International Assessment of Educational Progress (IAEP)

In conjunction with the International Assessment of Educational Progress, three questionnaires were administered to the national education minister, to administrators of participating schools, and to students sitting for the mathematics exam. Indicators here draw from results of the latter two.

The National Assessment of Educational Progress (NAEP)

In conjunction with the National Assessment of Educational Progress, three questionnaires were administered to administrators of participating schools, to teachers in participating classrooms, and to students sitting for the mathematics exam. Indicators here draw from results of all three of the questionnaires.

Comparing the IAEP and the NAEP

The IAEP and the NAEP employed mathematics tests that were so similar that comparisons across countries and states could be validly made. Each test administration was also accompanied by questionnaires that asked students, teachers, school administrators, and education ministers various questions about classroom practices, study habits, education system characteristics, and family backgrounds. While the tests given the students were very much alike, the IAEP and NAEP questionnaires were not so similar. Many questions were posed in the IAEP questionnaires that were not posed in the NAEP questionnaires, and vice versa.

Still, some questions are so naturally a part of such a study that they found their way into both sets of questionnaires. There were some questions common to both sets that were posed in an almost identical manner. Other questions, however, while much the same in meaning, contained differences in wording significant enough to, perhaps, influence some different responses. Other differences between the IAEP and NAEP could also influence some different responses. They include differing sample populations and times of administration.

The most straightforward way to determine if similar questions convey the same meaning to respondents and elicit the same responses is to compare the United States' average response in the IAEP to the United States' average response in the NAEP. They should be roughly similar numbers. If they are not, differences in question wording, time of administration, or sample populations may have influenced the results.

Only questions that appeared very similar in meaning between their IAEP and NAEP versions were chosen for inclusion in this report. Nonetheless, on two of these measures in particular, the United States' average from the IAEP appears very different than its average from the NAEP. These measures are the frequency of calculator use (in Indicator 17) and the frequency of group problem-solving in mathematics courses (in Indicator 19).

The following four tables make explicit this comparison between the questions that are common to the IAEP and NAEP and that are used in this report:

- IAEP/NAEP differences in responses for processes indicators, by test administration and indicator (Table S17);
- IAEP/NAEP sample population differences, by test administration and test or questionnaire characteristic (Table S18);
- IAEP/NAEP question differences, by test and indicator (Table S19); and
- Possible explanations of differences in U.S. responses between the IAEP and NAEP, by test and indicator (Table S20).

Table S17

IAEP/NAEP differences in responses for processes indicators, by test administration and indicator

Indicator	1991 IAEP U.S. average	1992 NAEP U.S. average	1992 NAEP states' range	1990 NAEP U.S. average
17:				
✓ Calculator use (%)	54[1]	71[1]	47–88	61
Computer use (%)	37[1]	40[1]	26–61	34
18:				
Homework hours (2+) daily	29[1]	25[1]	19–34	24
TV hours (2+) daily	16[1]	15[1]	10–28	12
19:				
Ability groups (%)	56[2,*]	61[3]	25–84	63
✓ Group problems (%)	49[1]	36[1]	27–47	28
weekly	68[1]	62[1]	46–92	66
Math tests (%) weekly				

✓Large difference between IAEP and NAEP averages for the United States.

[*] Large standard error.

[1] Student questionnaire.

[2] School questionnaire.

[3] Teacher questionnaire.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, ***Learning Mathematics***. U.S. Department of Education, National Center for Education Statistics, ***Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States***.

Table S18

IAEP/NAEP U.S. sample population differences, by test administration and test or questionnaire characteristic

Test or questionnaire characteristic	1991 IAEP	1992 NAEP
Time of administration	March 1991	Jan.–Mar. 1992
Age of students	Modal grade for 13-year-olds in March 1991 ● some 8th grade (60%) ● some 7th grade (35%)	8th grade only

Test or questionnaire characteristic	1991 IAEP	1992 NAEP
Sample frame	• 96 schools • 1,407 students • 71% overall response rate • 77% school response rate • 92% student response rate	• 406 schools • >2500 students in each state • 6% LEP and disabled students did not participate • 75% overall response rate • 84% school response rate • 89% student response rate
Public/private	Only public	Public and private
Questionnaire forms	• students • school administrators • education ministers	• students • teachers • school administrators

SOURCE: Educational Testing Service, International Assessment of Educational Progress, ***Learning Mathematics***. U.S. Department of Education, National Center for Education Statistics, ***Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States***.

Table S19

IAEP/NAEP question differences, by test and indicator

Indicator	IAEP	NAEP
17: Calculator use	"Ever use calculators in school"	(inverse of) "Never or hardly ever use calculators in math class"
Computer use	"Ever use computers for school work or homework"	(inverse of) "Never or hardly ever use computers for school work"
18: Homework hours	"Spend 2 hours or more on all homework everyday"	"2 or more hours each day on homework (in all subjects)"
TV hours	"Watch TV 1 hour a day or less" (inverse)	"Watch TV 1 hour a day or less" (inverse)
19: Ability groups	"Schools where math classes are based on ability"	Teachers report: "Yes, students are grouped by ability" (% of students)
Group work	"Solve problems in groups at least once a week"	"Work in small groups in Math Class at least weekly"
Take math tests	"Take a math test or quiz at least once a week"	"Take Math tests at least once a week"

SOURCE: Educational Testing Service, International Assessment of Educational Progress, ***Learning Mathematics***. U.S. Department of Education, National Center for Education Statistics, ***Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States***.

Table S20

Possible explanations of differences in U.S. responses between the IAEP and NAEP, by test and indicator

Indicator	Possible explanations
17: Calculator use	• Slight differences in question wording may elicit different responses. • It may be that 7th graders are less likely to use calculators than 8th graders, so much so that the fact that the IAEP sample includes some 7th graders affects the responses.
Computer use	• The rise in computer use over time may explain the small difference. Computer use increased from 34 to 40 percent between the 1990 and 1992 administrations of the NAEP. The U.S. average for computer use in the 1991 IAEP was 37 percent, in between the earlier and later NAEP averages.
18: Homework hours	• The difference is small.
TV hours	• The difference is small.
19: Ability groups	• The difference is small.
Group work	• Differences in question wording may account for difference in responses. The IAEP question may imply that when the entire class is working on a problem, that's group work. The NAEP asks specifically for *small* group work.
Take math tests	• The difference is small. It may be accounted for by difference in question wording. The IAEP includes "quizzes," while the NAEP question does not.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, ***Learning Mathematics***. U.S. Department of Education, National Center for Education Statistics, ***Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States***.

Indicator 23: Note on secondary school completion

Notes on Figure and Tables

Czechoslovakia

See notes to Indicator 10.

Denmark

The rate exceeds 100. Only 25 percent of the graduates are of the theoretical age, and many students take two diplomas at the upper secondary level (often both a general and a vocational program). Many young people must wait for a period of time before gaining entry to educational programs or before receiving an apprenticeship contract with a firm, despite the expansion of the intake capacity of upper secondary level institutions.

Finland

The graduation rate for all upper secondary education is over 100. This is due to the following facts: the upper secondary classification includes many different educational programs; only about one third of the graduates are of the theoretical age; and many young people complete more than one program at the secondary level.

France

Several programs lead to diplomas in technical and vocational education (CAP, BEP, and the vocational courses leading to the *Baccalaureate*), and some students complete more than one program. The effect of double counting has been removed from the data.

Germany (West)

The percentages reflect the high proportion of graduates completing more than one program at the upper secondary level.

Ireland

The data have been influenced by the use of population figures for 17-year-olds which were based on estimates supplied to OECD prior to the publication of the final results of the Census of Population for 1991. The revised population total of 17-year-olds indicates a rate of graduation at upper secondary education of 81.6 percent. Students completing a one-year pre-employment program at the upper secondary level and not completing the general upper secondary program are included in the total of graduates at this level. The total of such persons accounted for about 7 percent of the 17 year-olds.

Spain

Provisional figures.

United Kingdom

The figures concerning the graduates from general upper secondary education include all school-leavers, irrespective of age, who obtained at least 1 GSCE A level of the General Secondary Certificate of Education (GSCE). The GSCE O levels are also included.

United States

Data include graduates of regular day school programs, but exclude graduates of other programs and persons receiving high school equivalency certificates. They also exclude graduates of sub-collegiate departments of institutions of higher education.

In particular, GED program graduates are not included; only graduates of regular high school programs are included. If GED program graduates were included, the U.S. completion ratio would increase by almost 13 percentage points, to 86.8 percent.

Note on graduation reference age

See note on pp. 233-236.

Indicator 24: Note on university completion

Notes on Figure and Tables

Denmark

Data include graduates from colleges and other non-university tertiary institutions (for example, school teachers, nurses, journalists, graduates from general programs in business and administration, etc.) but exclude university graduates obtaining master's degrees.

France

See notes to Indicator 11.

Germany

The theoretical graduation age is 25 years for the former territory of the Federal Republic but is 23 years for the Eastern Länder and Berlin-East. Because the number of students is larger in the former territory of the Federal Republic than in the eastern Länder and Berlin-East, the weighted average of the theoretical age of graduation is 25 years, after rounding.

Ireland

The number of graduates is exclusive of post-graduate certificate and diploma graduates who previously obtained a primary (bachelor's) degree at the university level.

Spain, United Kingdom

Estimates.

United States

Due to the presence of several large, private universities in the District of Columbia that draw students primarily from outside the District, the completion ratio for the District may be misleading. Many of the graduated students either live outside the District and are not counted in the age-range population, or moved to the District solely for the purpose of attending school.

Note on graduation reference age

See note on pp. 233-236.

Indicator 25: Note on mathematics proficiency

Notes on Figure and Tables

Canada

Nine of ten provinces.

England, Scotland

School or student response rate is below the 85 percent standard employed by INES.

Israel

Hebrew-speaking schools.

Italy, Spain

Ninety percent or less of the international target population was sampled.

Portugal, Switzerland

School or student response rate is below the 85 percent standard employed by INES. Ninety percent or less of the international target population was sampled.

Soviet Union

Fourteen of fifteen republics. Russian-speaking schools only.

Spain

All regions except Cataluña. Spanish-speaking schools only.

Switzerland

Fifteen of twenty-six cantons included.

United States

The U.S. sample for the International Assessment of Educational Progress (IAEP) consisted of both public and private schools. Only 13-year-olds were included. The *state* samples for the National Assessment of Educational Progress (NAEP), on the other hand, consisted of 8th grade classrooms only in public schools. On average, students in the state samples were likely to be older than those in the U.S. sample in the IAEP.

Technical Notes

Description of levels of mathematics proficiency

Level 350: Multi-Step Problem Solving and Algebra — Students at this level can apply a range of reasoning skills to solve multi-step problems. They can solve routine problems involving fractions and percents, recognize properties of basic geometric figures, and work with exponents and square roots. They can solve a variety of two-step problems using variables, identify equivalent algebraic expressions, and solve linear equations and inequalities. They are developing an understanding of functions and coordinate systems.

Level 300: Moderately Complex Procedures and Reasoning — Students at this level are developing an understanding of number systems. They can compute with decimals, simple fractions, and commonly encountered percents. They can identify geometric figures, measure lengths and angles, and calculate areas of rectangles. These students are also able to interpret simple inequalities, evaluate formulas, and solve simple linear equations. They can find averages, make decisions on information drawn from graphs, and use logical reasoning to solve problems. They are developing the skills to operate with signed numbers, exponents, and square roots.

Level 250: Numerical Operations and Beginning Problem Solving — Students at this level have an initial understanding of the four basic operations. They are able to apply whole number addition and subtraction skills to one-step word problems and money situations. In multiplication, they can find the product of a two-digit and a one-digit number. They can also compare information from graphs and charts, and are developing an ability to analyze simple logical relations.

Level 200: Beginning Skills and Understandings — Students at this level have considerable understanding of two-digit numbers. They can add two-digit numbers, but are still developing an ability to regroup in subtraction. They know some basic multiplication and division facts, recognize relations among coins, can read information from charts and graphs, and use simple measurement instruments. They are developing some reasoning skills.

Level 150: Simple Arithmetic Facts — Students at this level know some basic addition and subtraction facts, and most can add two-digit numbers without regrouping. They recognize simple situations in which addition and subtraction apply. They also are developing rudimentary classification skills.

Issues in Linking Different Tests

Indicator 25 uses data drawn from two sources. The data for the countries included in Figure 25 and Table 25a were obtained from the 1991 International Assessment of Educational Progress (IAEP), which tested 13-year-olds in public and private schools in participating countries. The data for the states included in Figure 25 and Table 25b were obtained from the 1992 National Assessment of Educational Progress (NAEP) Trial State Assessment, which tested eighth graders in public schools. In order to compare the mathematics achievement of the countries, which were tested as part of the IAEP, and the states, which were tested as part of the NAEP, it is necessary to link scores on the two tests.

Several approaches to test linking are available, and the appropriate linking strategy depends on characteristics of the tests involved. Mislevy (1992) describes four main strategies: equating, calibration, projection, and moderation.

- **Equating** entails creating a common scale for two or more tests that are based on the same blueprint (such as two or more tests employing common item specifications). Equating is appropriate when tests share the same underlying conception of achievement, employ similar items, and are equally reliable. When tests have been equated, they can be used interchangeably.

- **Calibration** is a process of linking tests that measure the same dimensions of achievement but differ in reliability. When tests are calibrated, individuals receiving the same scores on the two tests have the same expected achievement, but, since calibrated scores are based on tests that differ in reliability, they cannot be used interchangeably for all purposes. For example, differences in reliability need to be taken into account in using calibrated scores to estimate the population standard deviation.

- **Projection**, which can be used when the assumptions underlying equating or calibration are not met, involves linking scores on tests that measure different dimensions of achievement. To the extent that performance on one test is correlated with performance on a second, the scores on the first test can be used to predict scores on the second, even if the two tests measure relatively distinct competencies. Because the projection method requires an estimate of the correlation between the scores on the two tests involved, the method requires a sample of individuals who have been given both tests. The adequacy of the projection approach to linking tests depends on the strength of the correlation between the tests involved, as well as on the extent to which the sample employed to estimate the prediction equation contains individuals with characteristics similar to those for which the predicted scores will be used. The linking sample needs to provide a good description of the relationship between the two tests involved but does not need to be a strict random sample of the population.

- Finally, **moderation** is a process in which scores from two or more tests that measure different things are aligned so that performance levels that are judged to be of comparable value or worth on the tests are given equal scores. One common moderation strategy involves rescaling scores to produce a common mean and standard deviation on the two tests. This approach rests on the belief that individuals who score at the same distance from the mean on the two tests (as measured in standard deviation units) have achieved similar levels of performance. Fundamentally, moderation is a method of placing tests that measure different constructs on a common metric. Moderation makes it possible to compare scores on two tests, but tests that have been moderated cannot be used interchangeably.

The choice of an appropriate strategy to use in linking the IAEP and the NAEP depends on the degree to which the two tests measure the same constructs in the same ways. Overall, the IAEP and NAEP have a number of similarities and differences. The IAEP curriculum framework was adapted from the framework used for the NAEP, and the two tests contain similar (but not identical) items and were administered using similar procedures. In addition, both tests have been scaled using item response theory (IRT) methods.[4]

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[4] For the NAEP and the IAEP IRT scales, conventional individual scale scores are not generated. Instead, the scaling process generates a set of five "plausible values" for each student. The five plausible values reported for each student can be viewed as draws from a distribution of potential scale scores consistent with the student's observed responses on the test and the student's measured background characteristics. In other words, the plausible values are constructed to have a mean and variance consistent with the underlying true population

At the same time, the two tests also differ in a number of ways, most notably in that the IAEP was explicitly designed to be administered in countries that differ in language, curriculum and instructional practice, while the NAEP was not. In addition, the tests differ in length. In the IAEP mathematics assessment, one common form of the test was administered to all 13-year-olds. The form included 76 items and students were given 60 minutes to complete the assessment (not including time for background questions). In the NAEP mathematics assessment, 26 different test booklets were prepared, each containing a somewhat different number of items, and each sampled student completed one booklet. A typical NAEP booklet included about 60 items, and students were given 45 minutes to complete the assessment (not including time for background questions). Because the IAEP was somewhat longer than the NAEP, the IAEP may provide somewhat more reliable individual-level scores.

Given the similarities and differences among the tests, it would be plausible to consider linking the tests through a process of calibration, projection, or moderation. Because the IAEP and NAEP tests differ in the detailed curriculum frameworks employed as well as in reliability, we chose a form of projection to predict NAEP scores from IAEP scores.

The projected NAEP scores reported for Indicator 25 are based on analyses conducted by Pashley and Phillips (1993) and Pashley, Lewis, and Yan (1994). In developing their estimates, Pashley and Phillips relied on data collected in a "linking study," in which both the IAEP and NAEP instruments were administered to a sample of 1,609 U. S. students who were in eighth grade or thirteen years old in the spring of 1992. Pashley and Phillips used the linking study data to estimate a linear regression model predicting a student's NAEP score on the basis of his or her IAEP score.[5] (See Table S21, row A, for the estimated coefficients.[6]) They then used the regression equation to develop predicted NAEP scores for the students in the IAEP sample in each participating country.[7] Using the predicted scores, Pashley and Phillips obtained various statistics, including the means and percentile scores for the nations presented in Indicator 25. (Table S22, column A, provides the projected NAEP-scale means Pashley and Phillips obtained for each IAEP country.)

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values. In this sense, the plausible values correct for unreliability. See Mislevy, Beaton, Kaplan, and Sheehan, 1992.

[5] The actual procedure used by Pashley and Phillips was somewhat more complex than the method described in the text. Five regressions were estimated, one for each pair of IAEP and NAEP plausible values (see the previous footnote). Given the sample sizes involved, the regression parameters produced by the five regressions differ only marginally.

[6] The regression parameters shown in the table are based on an approximate analysis using the reported correlation between the IAEP and the NAEP total mathematics score ($r = .825$), as well as the mean and the standard deviation of the IAEP and the NAEP in the linking sample, averaging across the five sets of plausible values. The results obtained by averaging in this way differ only slightly from the method used by Pashley and Phillips, based on separate regressions for each of the five plausible-value pairs. See the previous two footnotes.

[7] In the method as implemented by Pashley and Phillips, the five regression equations were each used to obtain predicted NAEP scores at the individual level; and the results were averaged to produce country means. The results are very similar to those that are obtained using the somewhat simpler method discussed in the text.

Table S21

Sensitivity of parameters used to link mean IAEP scores for countries to the NAEP scale to data source and method

Samples used		Method	Projected NAEP score at (IAEP = 500)	Additional NAEP points per IAEP point above 500
A	(IAEP cross-linking sample)	Projection	265	0.44
B	(IAEP cross-linking sample)	Moderation	263	0.53
C	(IAEP and 1990 NAEP Trial State Assessment in public schools)	Moderation	264	0.69
D	(IAEP and 1992 NAEP Trial State Assessment in public schools)	Moderation	270	0.72

NOTE and SOURCE: The IAEP scale range is from 0 to 1000; the NAEP scale range is from 0 to 500. Parameters in this table were calculated using information on the means and standard deviation of scores in each sample and, for line A, the correlation of the scores in the cross-linking sample. Pashley and Phillips (1993) used the sample and method of line A. Beaton and Gonzales (1993) used the samples and method of line C.

Table S22

Alternative projections of country mean IAEP scores onto the NAEP scale, by country

	Samples and Method				Difference in projections		
Country	A	B	C	D	(B - A)	(C - A)	(D - A)
Taiwan	285	287	297	303	2	12	6
Korea	283	286	294	301	3	11	7
Switzerland[1]	270	281	288	294	2	9	6
Soviet Union[2]	279	281	288	294	2	9	7
Hungary	277	279	285	291	2	8	6
France	273	274	278	284	1	5	6
Emilia Romagna, Italy[3]	272	272	276	283	0	4	6
Israel[4]	272	272	277	283	0	5	6
Canada[5]	270	270	274	280	0	4	6
Scotland	269	270	272	279	1	3	6
Ireland	269	268	271	277	-1	2	6
Slovenia	266	265	267	273	-1	1	6

Country	Samples and Method				Difference in projections		
	A	B	C	D	(B - A)	(C - A)	(D - A)
Spain[6]	263	261	262	267	-2	-1	5
United States[7]	262	260	262	266	-2	0	4
Jordan	246	241	236	240	-5	-10	4

[1] Fifteen out of 26 cantons.

[2] Fourteen out of 15 republics; Russian-speaking schools only.

[3] Combined school and student participation rate is below .80 but at least .70. Interpret with caution due to possible nonresponse bias.

[4] Hebrew-speaking schools only.

[5] Nine out of 10 provinces.

[6] All regions except Cataluña; Spanish-speaking schools only.

[7] Eighth-graders took the test and not all were 13 years old.

Samples and Method

A. Cross-linking sample and projection method
B. Cross-linking sample and moderation method
C. IAEP and NAEP 1990 public school samples and moderation method
D. IAEP and NAEP 1992 public school samples and moderation method

Difference in projections

(B - A) Moderation versus projection in same (cross-linking) sample
(C - A) Moderation and 1990 NAEP/IAEP samples versus projection and cross-linking sample
(D - A) 1992 NAEP/IAEP versus 1990 NAEP/IAEP both using moderation method

NOTE and SOURCE: Countries are sorted from high to low based on their mean scores using sample and method A — Cross-linking sample and projection method. Columns B and D are from Pashley, Lewis, and Yan (1994) and Beaton and Gonzales (1993), respectively. Both used student weighted data. Columns A and C are based in part on tabulations produced by the IAEP Processing Centre in June 1992. It appears that these tabulations did not use student weights. For most countries, the use of weights made little difference for estimated country mean IAEP scores. Switzerland is an exception, due to a complex sample design used there. Therefore, an unpublished weighted mean IAEP score of 532.36 was used instead of the published unweighted mean of 538.75 for Switzerland.

The most widely discussed alternative to the projection method used by Pashley and Phillips is a moderation method carried out by Beaton and Gonzalez (1993). Beaton and Gonzalez based their analysis on the 1991 IAEP United States sample and the 1990 NAEP eighth grade winter public school sample. They translated IAEP scores into NAEP scores by aligning the means and standard deviations for the two tests.[8] Using the techniques of linear equating, they estimated conversion constants to transform the U.S. IAEP scores into a distribution having the same mean and standard deviation as the 1990 NAEP scores. (The conversion constants are shown in Table S21, row C.) They then used these conversion constants to transform the IAEP scores for the students in the IAEP samples in each participating country into equivalent NAEP scores. (The moderated country NAEP-scale means produced by Beaton and Gonzalez are shown in Table S22, column C. Full state and nation results for Indicator 25 using the Beaton and Gonzalez method are displayed in Table S23.)

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[8] Like Pashley and Phillips, Beaton and Gonzalez carried out their procedure separately for each of the five sets of plausible values; and they then averaged the results obtained for each set. The results differ only slightly when their procedure is carried out once using published estimates of means and standard deviations.

The projection method used to develop Indicator 25 and the moderation method used by Beaton and Gonzalez produce somewhat different results, especially for countries with high average IAEP scores. (See Table S22.) For example, Korea is estimated to have a 1992 NAEP score of 283 using the projection method employed in Indicator 25 (see column A), while it has an estimated 1990 NAEP score of 294 using the Beaton and Gonzalez method (see column C).

The observed differences in transformed scores can be attributed in part to differences in the data sets on which Pashley and Phillips and Beaton and Gonzalez rely in developing their estimates. The students in the "linking study" sample used by Pashley and Phillips included both 13-year-olds and eighth graders in public and private schools. Beaton and Gonzalez used two samples to develop their estimates: the regular 1991 U.S. IAEP sample, and the regular winter eighth-grade 1990 NAEP administration. The 1991 United States IAEP sample on which they relied included 13-year-olds (but not other eighth graders) in public and private schools, while the 1990 NAEP sample included eighth graders (but not other 13-year-olds) in public schools only.[9] Perhaps as a result of these differences, the estimation samples have somewhat different distributions. Both estimation methods are particularly sensitive to the ratio of the standard deviations for the NAEP and IAEP.[10] In the linking sample used to develop the projection estimates, the ratio of the NAEP and IAEP standard deviations was about 0.53, while, for the samples used by Beaton and Gonzalez, the ratio of standard deviations was about 0.69. This difference in standard deviations generates predicted NAEP scores based on the projection method that are less distant from the mean than are the equivalent scores based on the Beaton and Gonzalez method.

To examine the sensitivity of the results to the samples used, we applied the Beaton and Gonzalez method to the data in the "linking sample" used by Pashley and Phillips.[11] The conversion coefficient estimates are shown in Table S21, row B, and the estimated country NAEP means are shown in Table S22, column B.[12] The estimated country means are much closer to the projection results obtained by Pashley and Phillips (column A) than are the Beaton and Gonzalez results obtained using the regular IAEP and 1990 winter public eighth grade samples. For example, the difference in the projection and moderation estimates for Korea drops from 11 to 3 points.

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[9] The 1990 NAEP mathematics results were rescaled in 1992, producing slightly different scale scores. Beaton and Gonzalez used the 1992 rescaling.

[10] The simple regression coefficient required for the projection method can be expressed as rs_y/s_x, where r is the correlation between the IAEP and the NAEP, s_y is the standard deviation of the NAEP, and s_x is the standard deviation of the IAEP. The conversion coefficient required for the moderation method is simply s_y/s_x.

[11] Given the data required, it is possible to develop moderation estimates similar to those developed by Beaton and Gonzalez for several different samples. But because the Pashley and Phillips projection method requires paired IAEP and NAEP data, the linking sample is the only data set in which it currently can be applied.

[12] As discussed in footnotes 4-7 above, Beaton and Gonzalez based their estimates on the full set of individual-level plausible values for each country. We developed the estimates in Tables S21 and S22 based only on the reported country means and standard deviations based on the plausible values. These results differ only slightly from those that would be obtained using the full set of plausible values.

To explore this issue further, we applied the moderation method using one additional NAEP data set: the 1992 public eighth grade sample. (This sample corresponds to the sample used in the 1992 Trial State Assessment on which the state results in Indicator 25 are based.) The conversion coefficients are displayed in Table S21 (row D); and the moderated NAEP-scale country means are displayed in Table S22 (column D). This sample produces country results more extreme than do any of the other samples we tried.

These experiments clearly indicate that different samples produce different results. But the experiments do not indicate which sample is "best". One advantage of the linking sample used by Pashley and Phillips is that the same students took both the IAEP and the NAEP. Hence, the estimated conversion coefficients are not biased by possible differences between the IAEP and NAEP samples. But the fact that the IAEP standard deviation in the linking sample is substantially higher than the standard deviation in the regular U.S. administration of the IAEP, while the NAEP standard deviation in the linking sample is similar to the regular NAEP standard deviation, may at least in part counterbalance the other apparent advantages of the linking sample.

In addition to the effects of the sample on coefficient estimates, several conceptual issues should be considered in evaluating linking methods. We briefly review three of these issues below: the age or grade-level interpretation placed predicted test scores; the effects on coefficient estimates of unreliability in the measures; and potential country-level contextual effects.

First, different linking approaches may produce results that differ in the age or grade-level for which the predicted scores are intended to apply. For example, since the data used by Pashley and Phillips to derive their coefficient estimates involved a sample of students who completed both the IAEP and the NAEP, the predicted NAEP scores based on their coefficients should be viewed as the NAEP scores that would be obtained by students of the same age or grade as the students whose IAEP scores are used as predictors. Since the regular country administration of the IAEP involved sampling 13-year-olds, the predicted NAEP scores using the Pashley and Phillips method should be viewed as predicted NAEP scores for 13-year-old students. The predicted NAEP scores obtained by Beaton and Gonzalez, on the other hand, should be interpreted as the scores 13-year-olds who took the IAEP would receive if they completed the NAEP in eighth grade.[13] Since average NAEP scores for eighth-graders are generally somewhat higher than average scores for 13-year-olds, the approach to sample specification used by Beaton and Gonzales is likely to produce somewhat higher scores than the approach used by Pashley and Phillips.

Linking methods may also differ in their sensitivity to unreliability in the predictor variable (in this case, the IAEP). In general, regression estimates of the effects of variables measured with error will be biased toward zero. Hence, projection coefficients estimated using unreliable measures are likely to be attenuated.[14] The effects of unreliability on conversion coefficients obtained using moderation methods are more difficult to determine. In the special case in which the predictor and outcome variables are measured with the same reliability, the moderation coefficients should be roughly unbiased.[15]

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[13] The interpretation of the predicted NAEP scores based on the moderation method is complicated by the fact that the IAEP sample used to develop the conversion constants included students in both public and private schools, while the NAEP sample included only public school students. Since the NAEP results for the full sample of eighth graders including both public and private students differ only modestly from the results for the sample including only public students, this problem probably accounts for relatively little of the difference in predicted outcomes for the projection and moderation approaches.

Finally, linking methods that are based on data from a single country may not properly reflect country-level contextual effects. Suppose, for example, that individual NAEP and IAEP scores were obtained for a sample of students in each of n countries.[16] Both the projection and moderation methods rest on an assumption that the relationship between IAEP and NAEP scores (pooling students across countries) can be expressed as a simple linear model of the form:

$$\text{estimated NAEP score} = \text{constant} + \text{slope} \times \text{IAEP score}$$

It is possible, however, that country-context effects exist. One simple specification might involve the addition of country dummies to the simple linear model above. If the country dummies differ significantly from zero, the within-country regression of NAEP scores on IAEP scores will not properly produce between-country relationships. Contextual effects of this sort might arise, for example, if the standardized test style used in the IAEP and NAEP is quite common in some countries, but rarely used in others. Unfortunately, without linked IAEP and NAEP data for a sample of countries, the possibility of contextual effects cannot be ruled out.

This brief discussion clearly indicates that different methods of linking the IAEP and NAEP can produce different results, and further study is necessary to determine which method is best. For this reason, Indicator 25 is labeled "experimental."

For more information on cross-linking and on the specific approaches used in developing Indicator 25, see Peter J. Pashley and Gary W. Phillips, ***Toward World-Class Standards: A Research Study Linking International and National Assessments*** (Princeton, NJ: Educational Testing Service, June, 1993); Peter J. Pashley, Charles Lewis and Duanli Yan, "Statistical Linking Procedures for Deriving Point Estimates and Associated Standard Errors," paper presented at the National Council on Measurement in Education (Princeton, NJ: Educational Testing Service, April, 1994); Albert E. Beaton and Eugenio J. Gonzalez, "Comparing the NAEP Trial State Assessment Results with the IAEP International Results," ***Setting Performance Standards for Student Achievement: Background Studies*** (Stanford, CA: National Academy of Education, 1993); Robert J. Mislevy, Albert E. Beaton, Bruce Kaplan, and Kathleen M. Sheehan, "Estimating Population Characteristics from Sparse Matrix Samples of Item Responses," ***Journal of Educational Measurement***, Summer, 1992, vol 29, no 2, pp 133-161; and Robert J. Mislevy, ***Linking Educational Assessments: Concepts, Issues, Methods, and Prospects*** (Princeton, NJ: Educational Testing Service, December, 1992).

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[14] The plausible values generated for the IAEP and NAEP are designed to reflect the true population mean and variance; but correlations among plausible values are attenuated due to unreliability.

[15] Since the IAEP and NAEP plausible values are designed to produce unbiased estimates of population variance, moderation methods that make use of the plausible values should not be sensitive to measurement error.

[16] To obtain valid NAEP scores in countries outside the United States, language and other issues would of course need to be taken into account.

Table S23

Mathematics proficiency scores for 13-year-olds in countries and public school 8th-grade students in states, calculated using the equi-percentile linking method, according to Beaton and Gonzales, by country (1991) and state (1990)

			Percent of population in each proficiency score range				
COUNTRY/State	Mean	SE	<200	200-250	250-300	300-350	>350
TAIWAN	296.7	1.5	3.2	13.4	33.9	36.6	12.9
KOREA	294.1	1.3	1.9	10.3	41.8	39.3	6.7
SOVIET UNION	287.6	1.5	0.8	10.4	53.1	34.0	1.7
SWITZERLAND	287.5	1.9	0.2	8.8	57.9	32.2	0.9
HUNGARY	284.8	1.4	1.4	13.5	52.6	29.9	2.7
North Dakota	281.1	1.2	0.8	13.2	60.0	24.8	1.3
Montana	280.5	0.9	0.5	14.3	59.5	24.9	0.8
FRANCE	278.1	1.3	1.4	16.8	57.5	23.4	1.0
Iowa	278.0	1.1	0.6	18.3	57.0	23.3	0.7
ISRAEL	276.8	1.3	1.5	15.6	61.6	20.7	0.6
ITALY	276.3	1.4	1.6	18.1	57.7	22.0	0.5
Nebraska	275.7	1.0	2.0	18.6	56.2	22.4	0.9
Minnesota	275.4	0.9	1.6	19.2	57.0	21.2	1.1
Wisconsin	274.5	1.3	1.5	20.8	55.4	21.6	0.7
CANADA	274.0	1.0	1.4	17.6	63.7	16.7	0.7
New Hampshire	273.2	0.9	1.4	21.2	58.1	18.9	0.5
SCOTLAND	272.4	1.5	1.6	20.6	59.7	17.7	0.4
Wyoming	272.2	0.7	1.1	20.9	60.3	17.4	0.2
Idaho	271.5	0.8	1.2	22.1	59.7	16.8	0.2
IRELAND	271.4	1.4	3.1	21.0	57.1	18.0	0.8
Oregon	271.4	1.0	2.2	23.8	54.2	19.2	0.6
Connecticut	269.9	1.0	3.2	25.3	50.7	20.1	0.7
New Jersey	269.7	1.1	2.4	26.9	50.2	19.7	0.8
Colorado (NAEP)	267.4	0.9	2.8	26.5	54.7	15.7	0.4
SLOVENIA	267.3	1.3	1.6	25.7	60.2	12.2	0.4
Indiana	267.3	1.2	2	28.2	53.9	15.4	0.5
Pennsylvania	266.4	1.6	3.2	27.5	53.0	15.8	0.5
Michigan	264.4	1.2	3.1	30.1	51.7	14.5	0.6
Virginia	264.3	1.5	3.3	32.8	47.3	15.4	1.3
Colorado (IAEP)	264.2	0.7	3.1	28.8	55.4	12.4	0.4
Ohio	264.0	1.0	3.1	30.5	52.4	13.8	0.3
Oklahoma	263.2	1.3	2.8	30.8	53.8	12.5	0.2

			Percent of population in each proficiency score range				
COUNTRY/State	**Mean**	**SE**	**<200**	**200-250**	**250-300**	**300-350**	**>350**
SPAIN	261.9	1.3	2.1	29.0	62.0	6.9	0.0
UNITED STATES(IAEP)	261.8	2.0	5.0	30.6	52.0	11.5	0.9
United States (NAEP)	261.8	1.4	5.0	31.5	49.0	14.0	0.5
New York	260.8	1.4	5.9	31.4	48.0	13.9	0.8
Maryland	260.8	1.4	5.7	33.1	45.3	15.3	0.6
Delaware	260.7	0.9	4.6	34.2	47.6	13.0	0.6
Illinois	260.6	1.7	5.7	31.4	49.1	13.4	0.5
Rhode Island	260.0	0.6	5.0	34.0	47.3	13.5	0.3
Arizona	259.6	1.3	4.5	33.8	49.7	11.7	0.4
Georgia	258.9	1.3	5.3	35.2	46.5	12.5	0.6
Texas	258.2	1.4	4.8	36.4	46.7	11.7	0.4
Kentucky	257.1	1.2	3.9	38.2	47.9	9.8	0.2
New Mexico	256.4	0.7	4.3	38.2	47.7	9.6	0.3
California	256.3	1.3	6.9	35.9	45.2	11.5	0.4
Arkansas	256.2	0.9	4.6	37.3	49.4	8.6	0.1
West Virginia	255.9	1.0	4.3	38.7	48.4	8.5	0.2
Florida	255.3	1.3	6.6	37.7	44.3	11.2	0.2
Alabama	252.9	1.1	6.2	40.5	44.8	8.3	0.3
Hawaii	251.0	0.8	9.9	39.2	39.8	10.6	0.5
North Carolina	250.4	1.1	7.9	41.2	42.6	8.1	0.0
Louisiana	246.4	1.2	8.2	46.1	40.6	4.9	0.2
JORDAN	236.1	1.9	16.0	48.3	32.6	3.1	0.0
District of Columbia	231.4	0.9	16.7	56.9	23.6	2.5	0.3

NOTE: Countries and states are sorted from high to low based on their mean proficiency scores. Colorado participated in both the NAEP Trial State Assessment and, separately, in the International Assessment of Educational Progress.

SOURCE: Albert E. Beaton and Eugenio J. Gonzalez, "Comparing the NAEP Trial State Assessment Results with the IAEP International Results," in ***Setting Performance Standards for Student Achievement: Background Studies*** (Stanford, CA: National Academy of Education, 1993).

Indicators 27 and 28: Note on earnings and education, and gender differences in earnings

Notes on Figures and Tables

Austria

Available income data do not include the self-employed. Therefore, no data have been provided to INES.

Belgium

The Belgian data are based on a survey directed to 4,000 persons. For small groups the sample estimates are sometimes not precise. The relative incomes published here have been calculated by the Belgian authorities.

Portugal

All sectors of the economy except agriculture are reported.

Switzerland

Income data and information about labor force status refer to December 1990. No information is available about incomes and labor force status during the whole year. Due to non-response, income data were missing for 21 percent of the respondents in the labor force survey. The number of people and incomes are reported for those who answered the income question.

Indicators 29: Note on new scientists and engineers

Notes on Figures and Tables

Asian countries

Detailed national education statistics were reconfigured to the International Standard Classification of Education (ISCED) and Classification of Instructional Programs (CID).

Europe

Detailed national education data were available for Austria, France, Germany, Switzerland, and the United Kingdom. These data were standardized.

Netherlands, United Kingdom

Data do not include open universities.

Spain, United Kingdom

Provisional figures.

United States

Due to the presence of several large, private universities in the District of Columbia that draw students primarily from outside the District, the completion ratio for the District may be misleading. Many of the graduates either live outside the District and are not counted in the age-range population, or moved to the District solely for the purpose of attending school.

Note on graduation reference age

See note on pp. 233-236.

Indicators 30, 31, 32, and 33: Note on current public expenditure as a percentage of GDP/GSP, current public education expenditure as a percentage of all public expenditure, current public education expenditure per student, and current public education expenditure per student relative to GDP/GSP per capita

Notes on Figures and Tables

All countries

Gross domestic product is gross national product less net property income from abroad.

Purchasing power parity indices (PPPI) were used to convert other currencies to U.S. dollars for the expenditure per student indicator. Because the fiscal year has a different starting date in different countries, within-country Consumer Price Indexes (CPI) were used to adjust the PPPIs to account for inflation.

Australia

Expenditure for higher education includes expenditure for vocational secondary education, which is taught in institutions of higher education.

Includes contributions to the pension funds of teachers who are civil servants.

Breakdowns of expenditure by initial source of funds for primary and secondary education are estimates only.

Fiscal year runs from July 1990 to June 1991.

Canada

Canada did not report separate figures for expenditures on preprimary education; preprimary expenditures are included in the primary-secondary expenditure figures. If one were to apportion Canada's expenditures across the preprimary and primary-secondary levels of education based on their relative enrollments, 4.8 percent of Canada's primary-secondary expenditures would move to the preprimary level. This change would not be enough to change Canada's relative ranking vis-a-vis the other G-7 countries on Indicators 30 and 31.

Preprimary enrollments are included in the calculation of Canada's expenditure-per-student figures for Indicators 30 and 33, however.

Canada, Japan, United Kingdom

Calculated figures from OECD, National Accounts; 3/4 (1990) + 1/4 (1991).

Finland

The public/private expenditure ratio that is reported for "all levels" is applied to both the primary-secondary and higher education levels.

France

The proportion of current expenditure that is public (and not private) is estimated using a public/private ratio in expenditure data from 1992.

Germany (West)

Data for 1991 are provisional estimates based on 1990 figures.

The proportion of public expenditure that is current (and not capital) is estimated from the current/capital ratio for total expenditures.

Hungary

The proportion of public expenditure that is current (and not capital) is estimated from the current/capital ratio for total expenditures.

Italy

1989 data.

Netherlands

Data for 1991 are partly provisional estimates based on 1990 figures.

Spain

Public expenditure for education is underestimated because a large part of the pension costs are not included.

Expenditures from private sources refer only to expenditure by households.

Sweden, United States

Calculated figures from OECD, National Accounts; 1/2 (1990) + 1/2 (1991).

United Kingdom

Excludes expenditure on nursing and paramedical education.

The proportion of current expenditure that is public (and not private) is estimated using a public/private ratio in expenditure data from 1992.

United States

For Indicators 30 and 33 — Due to the presence in the District of Columbia workforce of many who reside in the suburbs outside the District, the gross product of the District is abnormally large relative to its residential population. It is the size of its residential population however, that more directly determines its educational expenditure.

For Indicator 31 — only expenditures of state and local governments are used in the calculation of the state-level figures. This has the effect of excluding a portion of actual public spending — that emanating directly from the Federal government — in the state-level figures, but not in the U.S. national figure. Calculating the measure this way allows for more valid comparisons of "fiscal education effort" across states. But one should not expect the U.S. national figure to be a weighted average of the state figures. U.S. national public expenditure includes large sums for national defense, social security, and health insurance for the aged that one will not find in states' direct expenditure figures.

Current public expenditures on preprimary through secondary education do not include public funds used for private schools. These, however, are quite small in the United States.

Enrollment figures used for the per-student expenditure calculations differ between the United States as a whole and the individual states. The U.S. figure, submitted to the OECD is calculated from the U.S. Census Bureau's Current Population Survey (CPS) of October 1991, a household survey employing a national sample of households. The state data come from the National Center for Education Statistics, *Integrated Postsecondary Education Data System*, an *institutional* survey including the universe of U.S. higher education institutions. The NCES full-time equivalent enrollments for the U.S. as a whole differ from the CPS-derived enrollments only slightly.

Technical Notes

Calculation of GDPs and GSPs

The OECD source document listed 1991 country GDPs in 1985 U.S. dollars. The BEA source document listed 1990 state GSPs in 1990 U.S. dollars. The 1991 country GDPs, then, were converted to 1990 U.S. price levels using implicit price deflators for gross domestic product in 1985 and 1990 in the ***Economic Report of the President***, January, 1993. 1991 state GSPs were estimated from the 1990 GSPs per capita multiplied by the 1991 state populations.

Non-inclusion of proprietary schools

In the United States and some other countries exist a group of educational institutions that operate for profit, offering focussed educational programs that lead to specific vocational certificates, usually in periods of less than two years. These institutions are excluded from education data for the United States, and for some other countries as well.

Calculation of full-time equivalent enrollments

See technical notes for Indicator 8.

Methodology used for adjusting inflation rates

Although most countries report education expenditure for the calendar year (CY) 1991, eight countries have provided figures for financial years starting in April, June, or other months of 1990. Because of price inflation, the expenditure figures of the latter countries are not strictly comparable to those of countries that report for January-December 1991. For example, if a country with a 6 percent annual inflation rate submits expenditure figures for the financial year July 1990 to June 1991, that country's outlays will be about 3 percent less, simply because of inflation over a six-month period, than if the same country had provided data for CY 1991. For this reason, it is important to adjust the figures of the countries that do not report by calendar year to correct for inflation. Such adjustments affect finance indicators 30, 31, 32, and 33. Finance Indicators 34, 36, and 37 are not affected because they consist of ratios in which the numerators and denominators already pertain to the same period.

Adjustment for Indicator 32

Indicator 32's expenditure per student is expressed in equivalent U.S. dollars, converted at PPPI rates. In cases where countries have reported expenditures for CY 1991, the calculation is simply $(EXP/ENR)PPPI_{91}$ where EXP/ENR is expenditure per student in units of national currency and $PPPI_{91}$ is the PPPI exchange rate between 1991 units of national currency and 1991 U.S. dollars. In cases where countries' fiscal years begin in 1990, however, this formula has to be adjusted to reflect inflation between 1990 and 1991. The adjusted formula, reflected in the tables for Indicator 32, is

$$= (EXP/ENR)/PPPI_{ADJ}$$

where the adjusted PPPI rate, PPPI is calculated as a weighted average of the PPPIs applicable to 1990 and 1991 according to the equation,

$$PPPI_{ADJ} = W_{90}(PPPI_{90}) / (1 + r_{US}) + W_{91}(PPPI_{91}).$$

In this expression, $PPPI_{90}$ is the PPPI exchange rate between 1990 units of national currency and 1990 US dollars, r_{US} is the U.S. inflation rate between 1990 and 1991, and W_{90} and W_{91} are the weights applicable to 1990 and 1991, based on the starting and ending months of the country's school year. For example, $W_{90} = 0.75$ and $W_{91} = 0.25$ for a country with a financial year April 1990 to March 1991, but $W_{90} = 0.50$ and $W_{91} = 0.50$ for a country with a financial year July 1990 to June 1991).

Adjustments for Indicators 30, 31, and 33

Indicators 30, 31, and 33 compare educational expenditures with variables that normally are reported for CY 1991 — namely, GDP in the cases of 30 and 33 and total public expenditure for all purposes in the case of 31. To make the numerators and denominators of these indicators compatible, it is necessary to adjust the expenditure figures of countries that have not reported educational spending for the 1991 calendar year. The required adjustment is:

$$EXP_{ADJ} = EXP\ (1 + INF)$$

where EXP and EXP_{ADJ} are unadjusted and adjusted expenditures, respectively, and INF is the inflation rate for the number of months between the country's financial year and CY 1991. For example, if the country's fiscal year begins in July 1990, INF would be the inflation rate during a six-month period, or one-half the annual inflation rate between 1990 and 1991.

An exception to this procedure applies to two countries, Australia and New Zealand, for which national accounts data, including GDP and total public expenditure, are not reported by calendar year. For these two countries only, the educational expenditure figures have been adjusted to correspond to the year for which GDP is reported rather than to CY 1991.

Limitations to adjustments

Two limitations of these adjustment procedures should be recognized. First, the adjustments are for changes in the general (GDP) price level but not in the price level for education. No suitable PPPI figures are available that pertain specifically to education. Second, no allowance has been made for real growth in educational expenditure (increases in excess of inflation) that might have taken place during the 6-month or 9-month periods covered by the adjustments. It would only be possible to take real growth into account retroactively, after data for the 1991-92 financial year become available. Nevertheless, the adjustment for inflation does eliminate one significant source of non-comparability of expenditure figures, thereby enhancing the validity of the international comparisons of educational spending.

Indicator 34: Note on distribution of current public expenditure on education

Notes on Figure and Tables

Australia

Expenditure for higher education includes expenditure for vocational secondary education, as it is taught in institutions of higher education.

France

There is bias in the relationships between expenditure and enrollment shares by level of education because a substantial part of expenditure is not distributed by level of education.

Germany (West), Netherlands, Switzerland

See notes to Indicator 30.

Includes contributions to the pension funds of teachers who are civil servants.

Spain

Public expenditure for education is underestimated because a large part of the pension costs are not included.

United Kingdom

Excludes expenditure on nursing and paramedical education.

Technical Notes

Non-inclusion of proprietary schools

In the United States and some other countries exist a group of educational institutions that operate for profit, offering focused educational programs that lead to specific vocational certificates, usually in periods of less than two years. These institutions are excluded from education data for the United States, and for some other countries as well.

International comparisons of current public education expenditure

See note on pp. 236-242.

Methodology used for adjusting inflation rates

See technical note for Indicator 30.

Indicator 35: Note on teacher salaries

Notes on Figure and Tables

Sweden

The only available data for Sweden were those in a monthly salary schedule. Therefore, salary information is likely to be underestimated, as it does not include data on pay supplements and overtime.

United States

Due to the presence in the District of Columbia workforce of many who reside in the suburbs outside the District, the gross product of the District is abnormally large relative to its residential population. It is the size of its residential population, however, that more directly determines education expenditure, such as that for teacher salaries.

Technical Note

Teacher salaries have been adjusted across countries and states so that they exclude social security, retirement, and health insurance contributions. However, the salary figures include teacher pay for non-instructional tasks, such as counseling, administration, or coaching. International data include bonuses and supplements generally received by most teachers. In the United States, primary and high school teachers are paid on the same schedule, but in other nations high school teachers are frequently paid more than primary school teachers.

With the exception of the federated countries (i.e., United States, Canada, Australia, and Switzerland), international salary data are based upon national salary schedules. The mid-career salary comparison is made at the 15th year (or as close to the 15th year as possible) on the national salary schedules. Movement on salary schedules varies across countries, with some showing greater flexibility of advancement than others. It is therefore impossible to match years of experience directly with steps on the salary schedule.

Indicators 36 and 37: Note on sources of funds for education expenditure

Notes on Figures and Tables

Belgium

See notes to Indicator 30. Provincial or regional sources refer to the expenditures from the Flemish and French Communities; local or municipality sources refer to the expenditures from provinces and cities.

European Community countries

European Community member countries can receive funds from the EC Social Fund for vocational education in the upper secondary through graduate school levels. Ireland is the only country that reported these funds to INES.

Germany (West)

Expenditures by regional governments include subsidies from the Federal government. The private share of primary and secondary expenditure is influenced by the inclusion of large outlays by private firms for training and compensating apprentices under the dual system. Other countries with similar systems have not yet included such outlays in their educational expenditure figures.

Ireland

The source of international funding for education is the European Community Social Fund for vocational education at the upper secondary and higher education levels.

Netherlands

See notes to Indicator 30.

United States

For U.S. states, Federal portion consists of "Total Federal obligations to public and private colleges and universities" (***Digest of Education Statistics, 1993***, Table 357, column 2). State and local portions consist of "current-fund revenue from state and local governments" for public and private institutions (***Digest***, Table 324, columns 7–12)

Technical Note

International comparisons of current public education expenditure

See note on pp. 236–242.

STATISTICAL APPENDIX

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STATISTICAL APPENDIX

Note on standard errors

The information presented in this report was obtained from many sources, including federal, national, international, and state agencies, private research organizations, and professional associations. The data were collected using many research methods, including surveys of a universe (such as all colleges) or of a sample, compilations of administrative records, and statistical imputations. Readers should take particular care when comparing data from different sources. Differences in procedures, timing, phrasing of questions, and interviewer training mean that the results from the different sources may not be strictly comparable. In the Sources of Data section, descriptions of the information sources and data collection methods are presented, grouped by sponsoring organization. More extensive documentation of a particular survey's procedures does not imply more problems with the data, only that more information is available.

Many of the data in this report emanate from universe surveys. Higher education enrollment and finance figures from the Integrated Postsecondary Education Data System, for example, come from surveys that cover virtually all collegiate institutions in the United States.

Three of the most important sources of data for this report, however, provide estimates based on large samples. Figures from the ***1990 U.S. Census of Population and Housing*** are derived from a 5 percent sample of U.S. households that filled in the "long form" of the decennial Census. Figures from the ***International Assessment of Education Progress*** and ***National Assessment of Education Progress*** are derived from either of two samples — of students (13-year-old students in countries or 8th-grade public school students in the United States) or school administrators at participating schools.

Unless otherwise noted, all statements based on sample surveys cited in the text were tested for statistical significance and are statistically significant at the .05 level. Several test procedures were used. Which procedure was used depended upon the type of data being interpreted and the nature of the statement being tested. The most commonly used procedure was multiple *t*-tests with a Bonferoni adjustment to the significance level. When multiple comparisons between more than two groups were made, even if only one comparison is cited in the text, a Bonferoni adjustment to the significance level was made to ensure the significance level for the tests as a group was at the .05 level. This commonly arises when making comparisons between the United States and other countries or between U.S. states.

Accuracy of data

The accuracy of any statistic is determined by the joint effects of "sampling" and "nonsampling" errors. Estimates based on a sample will differ somewhat from the figures that would have been obtained if a complete census had been taken using the same survey instruments, instructions, and procedures. In addition to such sampling errors, all surveys, both universe and sample, are subject to design, reporting, and processing errors and errors due to nonresponse. To the extent possible, these nonsampling errors are kept to a minimum by methods built into the survey procedures. In general, however, the effects of nonsampling errors are more difficult to gauge than those produced by sampling variability.

Sampling errors

The samples used in surveys are selected from a large number of possible samples of the same size that could have been selected using the same sample design. Estimates derived from the different samples would differ from each other. The difference between a sample estimate and the average of all possible samples is called the sampling deviation. The standard or sampling error of a survey estimate is a measure of the variation among the estimates from all possible samples and, thus, is a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples.

The sample estimate and an estimate of its standard error permit us to construct interval estimates with prescribed confidences that the interval includes the average result of all possible samples. If all possible samples were selected under essentially the same conditions and an estimate and its estimated standard error were calculated from each sample, then: 1) approximately 2/3 of the intervals from one standard error below the estimate to one standard error above the estimate would include the average value of all possible samples; and 2) approximately 19/20 of the intervals from two standard errors below the estimate to two standard errors above the estimate would include the average value of all possible samples. We call an interval from two standard errors below the estimate to two standard errors above the estimate a 95 percent confidence interval.

The estimated standard errors for two sample statistics can be used to estimate the precision of the difference between the two statistics and to avoid concluding that there is an actual difference when the difference in sample estimates may only be due to sampling error. The need to be aware of the precision of differences arises, for example, when comparing mean proficiency scores between states in the National Assessment of Educational Progress. The standard error, s_{A-B}, of the difference between sample estimate A and sample estimate B (when A and B do not overlap) is:

$$s_{A-B}=\sqrt{s_A^2+s_B^2}$$

where s_A and s_B are the standard error of sample estimates A and B, respectively. When the ratio (called a *t*-statistic) of the difference between the two sample statistics and the standard error of the difference as calculated above is less than 2, one cannot be sure the difference is not due only to sampling error and caution should be taken in drawing any conclusions. In this report, for example, we would not conclude there is a difference. Some analysts, however, use the less restrictive criterion of 1.64, which corresponds to a 10 percent significance level, and would conclude there is a difference.

To illustrate this further, consider the data on mathematics proficiency of 13-year-olds in Table 25a and the associated standard error Table 25ax. The estimated average mathematics proficiency score for the sample of 13-year-olds in the United States was 262. For the sample in Ireland, the estimated average was 269. Is there enough evidence to safely conclude that this difference is not due only to sampling error and that the actual average mathematics proficiency of 13-year-olds in the United States is lower than for their counterparts in Ireland? The standard errors for these two estimates are 1.2 and 1.0, respectively. Using the above formula, the standard error of the difference is calculated as 1.6. The ratio of the estimated difference of 7 to the standard error of the difference of 1.6 is 4.38. Using the table below, it can be seen that there is less than a 1 percent chance that the 7 point difference is due only to sampling error, and one may safely conclude that the proficiency scores of 13-year-olds in the United States are lower than those of their counterparts in Ireland.

Percent chance[1] that a difference is due only to sampling error:					
t-statistic	1.00	1.64	1.96	2.00	2.57
Percent chance	32	10	5	4.5	1

When examining a table, most readers draw conclusions after making multiple comparisons within the table. In these circumstances, the chance that one of the many differences examined is only a result of sampling error increases (accumulates) as the number of comparisons increases. One procedure to ensure that the likelihood of any of the comparisons being only a result of sampling error stays less that 5 percent is to reduce this risk for each of the comparisons being made. If N comparisons are being made, then divide 5 percent by N and ensure that the risk of a difference being due only to sampling error is less than 5/N for each comparison. The table below provides critical values for the *t*-statistic for each comparison when it is a part of N comparisons.

Number of comparisons	1	2	3	4	5	10	20	40
Critical value[1]	1.96	2.24	2.39	2.50	2.58	2.81	3.02	3.23

For example, a reader might examine Table 25a not for the purpose of comparing the United States to Ireland but to compare the United States to, say, its economic competitors which includes many, say 10, of the countries in the table. After making 10 comparisons, the reader may want to draw the conclusion: "With the exception of Spain, 13-year-olds in the United States had lower mathematics proficiency scores than 9 other of its economic competitors for which data are available." If the reader uses the critical value of 1.96 to make each of the 10 comparisons, the chance that some component of the statement is due only to sampling error is greater than 5 percent. To compensate, the reader should use the critical value of 2.81. In this case, each of the 9 *t*-statistics is greater than 2.81 and the conclusion is safe to make.

It should be noted that most of the standard error estimates presented in subsequent sections and in the original documents are approximations. That is, to derive estimates of standard errors that would be applicable to a wide variety of items and could be prepared at a moderate cost, a number of approximations were required. As a result, the standard error estimates provide a general order of magnitude rather than the exact standard error for any specific item.

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[1] Based on a 2-tailed test.

Nonsampling errors

Universe and sample surveys are subject to nonsampling errors. Nonsampling errors may arise when respondents or interviewers interpret questions differently, when respondents must estimate values, or when coders, keyers, and other processors handle answers differently, when persons who should be included in the universe are not, or when persons fail to respond (completely or partially). Nonsampling errors usually, but not always, result in an understatement of total survey error and thus an overstatement of the precision of survey estimates. Since estimating the magnitude of nonsampling errors often would require special experiments or access to independent data, these nonsampling errors are seldom available.

Note on standard errors of estimates from the *International Assessment of Educational Progress* and the *National Assessment of Educational Progress*

(Indicators 16, 17, 18, 19, 20, 25)

Standard errors used here for these two data sources are, in most cases, copied directly from their own publications. In some cases, however, more than one category of response from a multiple response question have been combined. (Such cases are footnoted on the standard error tables when relevant.) To approximate the standard error for these figures, the design effect was obtained for each percentage included in the summation. The design effect was approximated for the combined percentage (represented in the tables) as the average of these component design effects. The standard errors presented represent the standard error that would result from a simple random sample, inflated by the square root of the average design effect of the component percentages.

Table 16ax: Standard errors for Table 16a

Country	Average class size
São Paulo and Fortaleza, Brazil	2.0
Canada	0.3
China	0.8
England	1.7
France	0.6
Hungary	0.8
Ireland	0.7
Israel	0.7
Emilia Romagna, Italy	1.9
Jordan	1.5
Korea	0.7
Portugal	0.8
Scotland	0.7
Slovenia	0.4
Soviet Union	1.1
Spain	0.7
Switzerland	0.7
Taiwan	0.6
United States	1.3

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, Figure 5.2.

Table 16bx: Standard errors for Table 16b

State	Average class size
Alabama	1.4
Alaska	2.0
Arizona	1.1
Arkansas	0.6
California	0.9
Colorado	1.2
Connecticut	1.5
Delaware	2.9
District of Columbia	2.2
Florida	1.1
Georgia	1.2
Hawaii	2.0
Idaho	1.2
Illinois	0.8
Indiana	1.0
Iowa	0.9
Kansas	0.9
Kentucky	1.5
Louisiana	1.4
Maine	1.4
Maryland	1.4
Massachusetts	1.2
Michigan	0.7
Minnesota	0.9
Mississippi	0.7
Missouri	1.6
Montana	1.4
Nebraska	0.9
Nevada	2.1
New Hampshire	3.3
New Jersey	1.9
New Mexico	1.2
New York	1.0
North Carolina	1.3
North Dakota	1.0
Ohio	1.2
Oklahoma	0.8
Oregon	0.9
Pennsylvania	1.9
Rhode Island	3.0
South Carolina	1.2
South Dakota	0.8
Tennessee	1.1
Texas	0.9
Utah	0.7
Vermont	1.1
Virginia	1.2
Washington	1.1
West Virginia	1.3
Wisconsin	1.5
Wyoming	0.9

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1990-91.

Table 17ax: Standard errors for Table 17a

Country	Percent who use calculators	Percent who use computers
São Paulo and Fortaleza, Brazil	0.5	0.5
Canada	1.3	1.1
China	1.1	0.9
England	1.8	2.8
France	0.5	1.4
Hungary	1.6	1.5
Ireland	2.2	1.3
Israel	2.3	1.7
Emilia Romagna, Italy	2.1	2.3
Jordan	0.8	0.6
Korea	0.5	0.8
Portugal	1.9	1.1
Scotland	1.2	1.5
Slovenia	2.5	1.3
Soviet Union	2.1	0.8
Spain	2.8	1.1
Switzerland	3.1	1.2
Taiwan	1.0	0.7
United States	3.5	1.7

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics* Figure 3.4.

Table 17bx: Standard errors for Table 17b

State	Percent who use calculators	Percent who use computers
Alabama	2.4	1.6
Arizona	2.0	1.5
Arkansas	2.0	1.5
California	1.9	1.7
Colorado	1.6	1.3
Connecticut	1.6	1.3
Delaware	0.9	1.1
District of Columbia	1.2	1.1
Florida	1.9	1.3
Georgia	2.0	1.5
Hawaii	1.0	1.0
Idaho	1.6	1.6
Indiana	2.1	1.3
Iowa	2.2	1.8
Kentucky	1.6	1.9
Louisiana	2.2	1.5
Maine	1.7	1.6
Maryland	1.8	1.7
Massachusetts	2.3	1.6
Michigan	2.0	1.6
Minnesota	1.5	1.4
Mississippi	2.1	1.6
Missouri	1.9	1.3
Nebraska	2.1	2.0
New Hampshire	1.7	1.4
New Jersey	2.3	1.5
New Mexico	1.8	1.4
New York	2.1	1.6
North Carolina	1.8	1.4
North Dakota	2.0	1.8
Ohio	2.3	1.5
Oklahoma	2.4	1.8
Pennsylvania	2.3	1.5
Rhode Island	0.9	1.1
South Carolina	1.7	1.6
Tennessee	2.1	1.3
Texas	1.8	1.6
Utah	1.6	1.3
Virginia	1.7	1.5
West Virginia	2.3	1.3
Wisconsin	2.3	2.0
Wyoming	1.9	1.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States,* Tables 10.15 and 10.23.

Table 18ax: Standard errors for Table 18a

Country	Percent of students who do 2 hours or more of homework daily	Percent of students who watch TV 2 hours or more daily
São Paulo and Fortaleza, Brazil	1.9	1.1
Canada	1.0	0.9
China	1.8	1.6
England	2.8	4.6
France	1.6	1.5
Hungary	1.3	0.8
Ireland	1.9	1.5
Israel	1.9	1.1
Emilia-Romagna, Italy	1.3	1.6
Jordan	2.0	1.2
Korea	1.7	1.3
Portugal	1.6	1.5
Scotland	1.1	1.0
Slovenia	1.7	1.6
Soviet Union	1.6	1.1
Spain	1.5	1.2
Switzerland	1.3	1.3
Taiwan	1.3	1.2
United States	1.8	1.6

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics,* Figure 4.3.

Table 18bx: Standard errors for Table 18b

State	Percent of students who do 2 hours or more of homework daily[*]	Percent of students who watch TV 2 hours or more daily
Alabama	0.8	0.7
Arizona	1.0	0.9
Arkansas	1.0	0.7
California	1.4	1.1
Colorado	1.0	1.0
Connecticut	1.1	0.9
Delaware	1.0	0.8
District of Columbia	1.4	0.6
Florida	1.0	0.9
Georgia	1.0	0.7
Hawaii	1.0	0.5
Idaho	0.9	0.9
Indiana	0.9	1.0
Iowa	0.9	0.9
Kentucky	1.0	0.7
Louisiana	1.1	0.6
Maine	1.2	0.9
Maryland	1.1	0.7
Massachusetts	1.2	1.0
Michigan	1.0	0.8
Minnesota	1.2	0.8
Mississippi	1.1	0.5
Missouri	1.0	0.7
Nebraska	1.0	1.0
New Hampshire	1.1	1.1
New Jersey	1.2	1.1
New Mexico	0.9	0.9
New York	1.7	0.8
North Carolina	1.1	0.8
North Dakota	1.1	0.9
Ohio	1.1	0.9
Oklahoma	1.1	0.9
Pennsylvania	1.0	0.9
Rhode Island	1.3	0.8
South Carolina	1.1	0.7
Tennessee	1.0	0.9
Texas	1.0	0.9
Utah	1.0	1.1
Virginia	1.2	0.8
West Virginia	0.9	0.7
Wisconsin	1.3	1.7
Wyoming	0.8	0.9

[*] The percentages represented in this column are the summation of component percentages available in the U.S. Department of Education's *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States*. See the "Note on standard errors of estimates from the IAEP and the NAEP" in the introduction to this section for information on how these standard errors were approximated.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States*, Tables 13.4 and 13.14.

Table 19ax: Standard errors for Table 19a

Country	Percent of schools where math classes are based on ability	Percent of students who do group problem-solving at least once per week	Percent of students who take math test or quiz at least once per week
São Paulo and Fortaleza, Brazil	5.3	2.5	2.7
Canada	1.3	1.4	0.9
China	1.9	2.1	2.2
England	4.7	3.1	5.8
France	7.3	1.2	1.3
Hungary	0.0	1.6	1.3
Ireland	6.1	1.6	1.5
Israel	7.2	1.7	2.2
Emilia Romagna, Italy	4.7	1.1	1.6
Jordan	2.6	1.1	1.5
Korea	0.0	1.6	1.9
Portugal	3.6	1.6	1.8
Scotland	4.1	1.6	1.3
Slovenia	1.6	1.5	1.5
Soviet Union	3.0	1.8	1.5
Spain	1.8	1.5	1.7
Switzerland	7.3	1.5	2.5
Taiwan	7.6	1.2	1.1
United States	9.9	2.4	2.1

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, Figures 3.1 and 3.5.

Table 19bx: Standard errors for Table 19b

State	Percent of schools where math classes are based on ability	Percent of students who do group problem-solving at least once per week	Percent of students who take math test at least once per week*
Alabama	3.7	2.2	1.1
Arizona	3.7	1.6	1.8
Arkansas	4.0	2.1	1.5
California	3.5	2.2	1.7
Colorado	3.8	2.0	1.7
Connecticut	3.5	1.8	1.7
Delaware	0.5	1.0	1.4
District of Columbia	1.0	1.1	1.1
Florida	2.8	1.9	1.4
Georgia	3.2	2.3	1.3
Hawaii	0.6	1.2	1.1
Idaho	3.5	2.1	1.4
Indiana	3.9	1.6	1.9
Iowa	4.7	2.4	2.0
Kentucky	3.9	2.6	1.3
Louisiana	4.4	2.1	1.1
Maine	4.3	2.2	1.6
Maryland	2.5	2.1	1.3
Massachusetts	2.8	1.7	1.6
Michigan	4.0	2.5	1.7
Minnesota	4.1	2.8	1.6
Mississippi	3.5	1.6	1.1
Missouri	4.0	1.9	1.7
Nebraska	4.5	2.7	1.7
New Hampshire	3.9	1.7	1.5
New Jersey	3.7	2.4	1.8
New Mexico	3.5	1.6	1.5
New York	3.7	1.5	1.6
North Carolina	3.4	2.0	1.5
North Dakota	2.9	2.1	1.8
Ohio	4.2	2.3	1.9
Oklahoma	4.3	1.4	1.8
Pennsylvania	3.5	1.9	1.4
Rhode Island	0.7	1.1	1.3
South Carolina	3.3	1.8	0.9
Tennessee	3.8	1.7	1.4
Texas	3.3	2.4	1.4
Utah	2.4	1.6	1.4
Virginia	3.1	1.6	1.1
West Virginia	3.4	2.0	1.9
Wisconsin	4.9	2.4	1.7
Wyoming	2.9	2.1	1.4

*The percentages represented in this column are the summation of component percentages available in the U.S. Department of Education's *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States*. See the "Note on standard errors of estimates from the IAEP and the NAEP" in the introduction to this section for information on how these standard errors were approximated.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States*, Tables 9.4, 9.16, and 9.33.

Table 20ax: Standard errors for Table 20a

Country	Average minutes of instruction per school day	Days of instruction per year	Average hours of instruction per year
São Paulo and Fortaleza, Brazil	0.7	2.5	—
Canada	0.2	1.4	—
China	2.1	2.1	—
England	1.8	3.1	—
France	1.7	1.2	—
Germany (West)	—	—	—
Hungary	1.5	1.6	—
Ireland	0.9	1.6	—
Israel	2.2	1.7	—
Emilia Romagna, Italy	0.5	1.1	—
Japan	—	—	—
Jordan	1.6	1.1	—
Korea	0.4	1.6	—
Portugal	1.1	1.6	—
Scotland	0.9	1.6	—
Slovenia	1.5	1.5	—
Soviet Union	2.1	1.8	—
Spain	2.3	1.5	—
Switzerland	3.2	1.5	—
Taiwan	2.5	1.2	—
United States	0.4	2.4	—

— Not applicable or available.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, ***Learning Mathematics,*** Figure 5.2. For West Germany: International Association for the Evaluation of Educational Achievement (IEA) Study of Reading Literacy, 1992. For Japan: Ministry of Education, Science, and Culture, National Institute of Educational Research, Government of Japan, 1992.

Table 20bx: Standard errors for Table 20b

State	Average hours of instruction per school day	Days of instruction per year	Average hours of instruction per year
Alabama	0.0	0.3	7.0
Alaska	0.1	0.3	23.8
Arizona	0.1	0.5	12.0
Arkansas	0.1	0.8	9.2
California	0.2	0.4	34.7
Colorado	0.1	1.6	12.7
Connecticut	0.0	1.4	9.1
Delaware	0.2	0.8	38.6
District of Columbia	0.0	0.2	5.0
Florida	0.2	0.4	28.7
Georgia	0.1	0.2	9.7
Hawaii	0.0	0.4	6.2
Idaho	0.1	0.1	7.6
Illinois	0.0	1.0	9.6
Indiana	0.1	0.2	10.2
Iowa	0.1	0.0	11.0
Kansas	0.0	0.4	5.9
Kentucky	0.1	1.2	13.9
Louisiana	0.1	1.7	13.9
Maine	0.1	0.3	10.1
Maryland	0.1	0.8	14.5
Massachusetts	0.1	0.1	10.9
Michigan	0.1	0.4	20.8
Minnesota	0.1	0.7	15.9
Mississippi	0.1	0.5	12.0
Missouri	0.1	1.2	12.8
Montana	0.1	0.3	8.1
Nebraska	0.1	1.9	27.5
New Hampshire	0.1	0.4	19.0
Nevada	0.1	0.3	11.3
New Jersey	0.1	0.2	18.8
New Mexico	0.1	1.8	13.7
New York	0.1	0.5	13.1
North Carolina	0.1	0.8	17.1
North Dakota	0.2	0.3	29.1
Ohio	0.1	0.2	17.9
Oklahoma	0.1	1.0	16.6
Oregon	0.1	0.6	9.9
Pennsylvania	0.0	0.2	6.8
Rhode Island	0.0	0.1	4.8
South Carolina	0.1	0.6	15.7
South Dakota	0.1	0.2	10.3
Tennessee	0.0	0.7	10.0
Texas	0.0	0.1	3.9
Utah	0.1	2.3	17.6
Vermont	0.1	0.4	10.3
Virginia	0.1	0.2	14.4
Washington	0.1	0.3	8.2
West Virginia	0.1	0.6	12.8
Wisconsin	0.1	0.6	14.0
Wyoming	0.1	0.2	20.5

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1990-91 (based on Table 49-3 in *The Condition of Education, 1993*).

Table 25ax: Standard errors for averages and percentile scores in Table 25a

	Average proficiency	Percentile score						
		5th	10th	25th	50th	75th	90th	95th
Canada	0.7	1.2	1.0	0.8	0.7	0.8	1.0	1.1
France	0.9	1.5	1.2	1.0	0.9	1.0	1.1	1.3
Hungary	1.0	1.8	1.5	1.1	1.0	1.0	1.3	1.5
Ireland	1.0	1.7	1.4	1.1	1.0	1.0	1.2	1.4
Israel	0.9	1.5	1.3	1.0	0.9	0.9	1.1	1.3
Italy	1.0	1.6	1.3	1.1	1.0	1.0	1.2	1.3
Jordan	1.1	1.9	1.6	1.3	1.2	1.2	1.3	1.4
Korea	1.1	1.9	1.5	1.2	1.1	1.2	1.5	1.7
Scotland	0.9	1.5	1.3	1.0	0.9	1.0	1.1	1.3
Slovenia	0.9	1.4	1.3	1.1	0.9	1.0	1.1	1.3
Soviet Union	1.0	1.5	1.3	1.1	1.0	1.0	1.2	1.3
Spain	0.9	1.4	1.2	1.0	0.9	0.9	1.1	1.2
Switzerland	0.8	1.2	1.1	0.9	0.8	0.9	1.1	1.2
Taiwan	1.3	2.2	1.3	1.4	1.3	1.4	1.9	2.3
United States	1.2	2.1	1.7	1.3	1.2	1.2	1.5	1.7

SOURCE: Educational Testing Service, IAEP/NAEP Cross-linking Study, 1993.

Table 25bx: Standard errors for averages and percentile scores in Table 25b

	Average proficiency	Percentile score						
		5th	10th	25th	50th	75th	90th	95th
Alabama	1.7	4.2	1.9	1.8	2.0	1.7	2.0	2.8
Arizona	1.3	2.1	1.6	1.3	1.9	1.2	1.3	1.4
Arkansas	1.2	2.9	1.6	1.2	1.2	1.6	1.6	1.7
California	1.7	3.0	2.7	2.6	1.8	1.7	2.5	3.8
Colorado	1.1	2.8	1.6	1.2	1.1	1.2	1.2	1.2
Connecticut	1.1	3.3	2.6	1.7	0.8	1.0	1.4	2.4
Delaware	1.0	3.1	1.8	0.9	1.3	1.5	1.4	1.9
District of Columbia	0.9	1.7	1.0	1.2	1.8	2.8	1.7	3.4
Florida	1.5	2.0	3.0	1.6	2.0	1.7	2.0	1.4
Georgia	1.2	1.9	1.5	1.5	1.3	2.1	1.5	1.8
Hawaii	0.9	2.7	1.5	1.0	1.6	1.0	1.3	1.6
Idaho	0.8	2.1	1.1	0.9	1.2	0.8	1.1	1.8
Indiana	1.2	1.9	1.5	1.2	1.3	1.9	2.9	1.1
Iowa	1.0	1.1	2.1	1.4	1.1	1.5	1.6	2.6
Kentucky	1.1	3.3	1.7	1.6	1.0	1.3	2.8	1.8
Louisiana	1.7	2.8	2.6	2.2	1.6	2.0	1.8	2.1
Maine	1.0	1.8	2.3	1.2	1.1	1.7	1.3	2.6
Maryland	1.3	2.9	1.8	2.3	1.3	1.6	1.6	1.9
Massachusetts	1.1	2.4	1.4	2.2	2.0	1.6	1.7	2.3
Michigan	1.4	1.6	1.4	2.3	1.6	2.9	2.3	1.7
Minnesota	1.0	2.4	1.4	1.4	1.3	1.4	1.4	2.0
Mississippi	1.2	2.6	1.2	1.3	1.2	1.6	2.0	2.8
Missouri	1.2	1.8	2.9	1.8	1.4	1.6	1.3	2.2
Nebraska	1.1	1.8	1.7	1.2	1.4	1.0	1.6	3.5
New Hampshire	1.0	1.0	1.1	0.8	0.9	1.1	2.0	2.9
New Jersey	1.6	2.8	1.9	2.0	1.9	2.2	1.6	1.3
New Mexico	0.9	2.0	2.0	0.9	1.0	1.0	1.3	2.1
New York	2.1	6.5	3.1	2.8	1.8	1.4	2.4	1.5
North Carolina	1.2	3.1	2.6	1.3	1.2	1.4	1.5	2.5
North Dakota	1.2	2.3	1.2	1.4	1.0	1.4	1.7	1.2
Ohio	1.5	2.9	1.9	2.0	1.6	1.4	1.5	1.8
Oklahoma	1.2	3.6	1.3	1.4	1.1	1.4	1.5	1.8
Pennsylvania	1.5	2.2	2.3	1.5	1.4	1.1	1.8	1.8
Rhode Island	0.7	1.5	1.2	1.1	1.2	1.7	1.1	0.9
South Carolina	1.0	1.6	1.3	1.1	1.2	1.7	1.5	1.8
Tennessee	1.4	3.5	2.1	1.5	1.6	1.4	1.5	2.8
Texas	1.3	1.2	2.6	1.2	1.9	2.3	1.5	3.3
Utah	0.7	1.3	1.2	1.7	0.8	1.2	1.2	1.8
Virginia	1.2	1.8	1.5	1.7	1.7	1.6	1.5	1.9
West Virginia	1.0	2.7	1.5	1.0	1.7	1.1	1.8	1.8
Wisconsin	1.5	3.8	2.6	2.1	1.5	1.5	1.4	1.9
Wyoming	0.9	1.1	1.0	1.2	1.2	1.2	1.1	2.6

NOTE: The states of Alaska, Illinois, Kansas, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington did not participate either year.

SOURCE: Educational Testing Service, IAEP/NAEP Cross-linking Study, 1993.

Note on standard errors of U.S. Census estimates

Instructions for calculating standard errors for indicators based on U.S. Census estimates (Indicators 2, 3, 8, 9, 10, 11, 12, 13, 21, 22, 23, 24, 26, 27, 28, 29)

Data for these indicators were prepared from a 5 percent public use microdata sample based on the 1990 Census long form sample. Differences between these figures and the actual numbers may stem from several sources, categorized as either "sampling errors" or "non-sampling errors." "Sampling error" refers to differences between the actual figures and those that are estimated from a sample. All estimates based on samples are subject to sampling error, and methods are readily available to estimate the likelihood of this type of error. This note explains how to estimate the precision of these U.S. Census estimates. Other errors, known as "non-sampling errors" are more difficult to quantify, and stem from errors in reporting, data collection, processing, and estimation. The method discussed here does not address non-sampling errors.

The "standard error" is a measure of the sampling error of an estimate from a sample. In general, we can be about 95 percent certain that the actual value falls within an interval defined by the estimate plus or minus two times the standard error. This interval is called the "95 percent confidence interval."

Below, we describe how standard errors and confidence intervals can be calculated. Because the microdata sample is not based on a simple random sample, the sample design slightly complicates calculation of the standard error. Here, we provide a simple method for approximating the standard errors for the U.S. Census estimates, taking into account that they are not based upon a simple random sample. The approximation entails two steps: first, calculate the standard error as though it resulted from a simple random sample. Second, apply an adjustment factor (called the "design factor") that reflects the differences between the actual sample design and a simple random sample design.

Step 1: Use the formula given below to calculate the unadjusted standard error assuming a simple random sample. (Base population numbers are provided in Table S23 and the estimated percentage is found in the tables of the corresponding indicator.)

$Se_{(p)} = ((19/B)*p(100-p))^{1/2}$ where:
$B =$ base population of estimated percentage (weighted total), obtained from Table S23, and
$p =$ estimated percentage, obtained from the indicator table

Step 2: First, identify the appropriate characteristic and the corresponding design effect from the list in Table S22. (For example, if calculating the standard error for a percentage in Indicator 3, Labor force participation, the appropriate population characteristic would be "Employment status," and the corresponding design effect would be 1.2.)

Then, multiply the unadjusted standard error assuming a simple random sample found in step 1 by the design effect identified above. The resulting value approximates the (adjusted) standard error.

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The standard error can be multiplied by two to obtain the 95 percent confidence interval.

NOTE: Standard errors of percentages derived in this manner are approximate. Calculations can be expressed to several decimal places, but to do so would indicate more precision in the data than is justifiable. Final results should contain no more than two decimal places.

Table S22

Standard error design factors

Characteristic	Design factor
Age	1.2
Sex	1.2
Educational attainment	1.3
School enrollment	1.8
Employment status	1.2
Household income in 1989	1.2

Table S23: Base populations for indicators using 1990 U.S. Census estimates, by population group (and indicator) and state: 1990

	Total population (2)	Those aged 25-64 having attained less than an upper-secondary education (3, 21, 22)	Those aged 25-64 having attained an upper secondary education (3, 21, 22)	Those aged 25-64 having attained a non-university level of higher education (3, 21, 22)	Those aged 25-64 having attained a university level of higher education (3, 21, 22)
Alabama	4,032,992	519,594	1,025,338	118,463	353,424
Alaska	550,696	34,539	173,271	23,556	71,304
Arizona	3,652,849	328,791	956,591	141,870	394,175
Arkansas	2,344,205	292,388	626,829	48,911	174,092
California	29,715,727	3,294,217	6,985,014	1,360,868	3,916,557
Colorado	3,282,756	211,083	911,535	135,537	518,481
Connecticut	3,282,130	261,549	814,316	133,029	540,890
Delaware	661,667	60,564	179,884	25,314	80,702
District of Columbia	609,866	76,365	125,331	10,365	121,561
Florida	12,922,903	1,360,670	3,315,894	519,690	1,315,227
Georgia	6,466,023	787,825	1,669,848	190,341	711,864
Hawaii	1,104,668	77,632	299,833	58,059	145,425
Idaho	990,916	74,112	268,780	40,844	92,940
Illinois	11,393,796	1,043,190	3,009,738	388,620	1,399,395
Indiana	5,548,329	527,363	1,612,172	172,389	484,783
Iowa	2,766,658	171,565	786,323	123,233	261,415
Kansas	2,471,342	159,564	690,308	77,738	294,896
Kentucky	3,667,395	523,901	959,275	88,851	283,658
Louisiana	4,188,408	528,510	1,080,291	76,434	367,638
Maine	1,226,904	100,377	356,437	47,101	128,709
Maryland	4,780,796	429,913	1,268,671	150,805	757,507
Massachusetts	6,015,898	465,088	1,432,852	263,995	983,438
Michigan	9,284,810	796,222	2,642,541	366,907	918,677
Minnesota	4,366,568	234,538	1,215,842	220,184	551,568
Mississippi	2,560,194	355,047	583,845	71,868	200,487
Missouri	5,101,921	482,167	1,432,263	135,668	519,904
Montana	796,317	50,277	232,713	25,250	89,765
Nebraska	1,578,049	86,646	453,106	64,450	168,066
Nevada	1,195,956	117,528	388,951	43,933	108,198
New Hampshire	1,104,242	76,532	300,625	54,405	156,065
New Jersey	7,698,998	706,486	1,991,871	250,351	1,172,365
New Mexico	1,507,146	156,615	391,500	42,624	164,343
New York	17,919,274	1,855,007	4,385,204	717,705	2,471,883
North Carolina	6,612,198	816,603	1,698,468	269,895	660,741
North Dakota	635,095	41,380	159,135	36,740	64,850
Ohio	10,832,284	1,026,244	3,093,792	341,228	1,041,431
Oklahoma	3,137,119	300,613	866,886	92,913	308,512
Oregon	2,832,819	200,308	803,533	117,126	337,826
Pennsylvania	11,853,450	1,049,928	3,340,514	376,087	1,260,960
Rhode Island	1,002,334	102,546	240,469	39,689	124,020
South Carolina	3,480,936	249,072	398,142	56,502	131,691
South Dakota	693,206	49,763	183,262	28,198	63,369
Tennessee	4,861,437	655,269	1,291,089	117,864	450,267
Texas	16,951,382	2,006,956	4,193,562	496,337	1,899,984
Utah	1,721,828	88,011	415,466	64,664	181,096
Vermont	559,333	41,295	147,278	22,708	76,457
Virginia	6,181,215	651,846	1,571,202	201,465	884,319
Washington	4,841,964	312,114	1,360,521	230,841	635,046
West Virginia	1,785,999	237,025	501,027	38,963	121,635
Wisconsin	4,881,441	349,292	1,397,287	203,045	490,656
Wyoming	453,189	29,777	136,705	18,379	45,490

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table S23: Base populations for indicators using 1990 U.S. Census estimates, by population group (and indicator) and state: 1990 — Continued

	Females aged 25-64 having attained any level of education (3)	Those aged 25-64 having attained any level of education (3, 21 22)	Population aged 5-29 (8)	Population aged 3 (9)	Population aged 4 (9)
Alabama	1,043,585	2,016,819	1,533,935	56,459	54,754
Alaska	141,166	302,670	221,701	10,864	11,066
Arizona	920,095	1,821,427	1,385,015	56,497	57,785
Arkansas	589,845	1,142,220	866,167	30,445	33,564
California	7,727,768	15,556,656	11,518,016	465,730	463,467
Colorado	891,087	1,776,636	1,219,314	50,781	51,723
Connecticut	892,564	1,749,784	1,150,535	45,472	44,656
Delaware	177,499	346,464	243,857	10,232	9,507
District of Columbia	174,028	333,622	226,724	7,756	6,929
Florida	3,332,752	6,511,481	4,259,566	171,751	165,774
Georgia	1,724,507	3,359,878	2,544,216	97,425	96,243
Hawaii	288,700	580,949	418,850	16,932	15,192
Idaho	238,508	476,676	388,836	15,180	16,400
Illinois	2,980,848	5,840,943	4,248,087	166,929	170,607
Indiana	1,430,534	2,796,707	2,106,765	80,061	80,278
Iowa	681,181	1,342,536	1,006,842	37,718	40,205
Kansas	611,763	1,222,506	920,390	40,375	39,264
Kentucky	951,443	1,855,685	1,399,535	49,469	51,153
Louisiana	1,067,235	2,052,873	1,679,646	67,503	68,625
Maine	320,492	632,624	446,064	16,571	17,514
Maryland	1,334,604	2,606,896	1,748,922	70,755	71,570
Massachusetts	1,606,639	3,145,373	2,201,919	81,914	81,852
Michigan	2,415,970	4,724,347	3,520,997	138,609	142,749
Minnesota	1,114,281	2,222,132	1,644,490	68,318	70,764
Mississippi	634,605	1,211,247	1,032,204	38,646	40,230
Missouri	1,316,927	2,570,002	1,863,612	73,198	74,555
Montana	200,145	398,005	287,447	11,163	12,655
Nebraska	389,309	772,268	591,637	25,988	24,866
Nevada	318,906	658,610	430,204	18,904	17,907
New Hampshire	294,044	587,627	405,419	16,549	17,583
New Jersey	2,115,324	4,121,073	2,690,010	102,636	103,776
New Mexico	382,890	755,082	592,995	26,085	25,260
New York	4,878,896	9,429,799	6,449,386	249,121	241,175
North Carolina	1,765,851	3,445,707	2,489,916	91,251	87,999
North Dakota	148,645	302,105	244,275	10,080	9,075
Ohio	2,831,467	5,502,695	4,008,942	156,982	160,728
Oklahoma	800,372	1,568,924	1,174,962	43,472	47,418
Oregon	734,627	1,458,793	994,764	39,586	42,144
Pennsylvania	3,094,787	6,027,489	4,119,431	158,118	163,466
Rhode Island	259,269	506,724	360,839	14,624	12,842
South Carolina	906,690	835,407	1,361,184	50,529	51,645
South Dakota	162,573	324,592	265,416	10,694	11,456
Tennessee	1,297,536	2,514,489	1,799,136	67,221	67,893
Texas	4,341,596	8,596,839	6,817,596	280,864	281,227
Utah	375,887	749,237	793,476	32,736	35,285
Vermont	145,008	287,738	209,345	8,828	8,631
Virginia	1,676,016	3,308,832	2,341,284	85,107	86,967
Washington	1,267,539	2,538,522	1,778,088	73,326	73,986
West Virginia	464,116	898,650	635,764	21,541	22,375
Wisconsin	1,224,162	2,440,280	1,827,575	72,317	74,850
Wyoming	.114,422	230,351	174,931	6,849	7,158

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table S23: Base populations for indicators using 1990 U.S. Census estimates, by population group (and indicator) and state: 1990 — Continued

	Population aged 5 (9)	Population aged 6 (9)	Population aged 14 (10)	Population aged 15 (10)	Population aged 16 (10)
Alabama	58,830	57,851	54,705	61,372	59,618
Alaska	10,663	10,551	8,002	7,566	7,267
Arizona	57,642	53,912	49,972	48,926	50,747
Arkansas	35,234	33,332	34,069	33,889	34,581
California	468,129	449,129	373,607	379,311	373,930
Colorado	49,866	52,095	43,296	43,266	41,070
Connecticut	44,588	43,700	39,205	40,042	37,696
Delaware	8,599	9,619	8,181	7,757	8,105
District of Columbia	7,044	6,224	5,406	5,922	6,055
Florida	167,500	165,535	146,650	153,514	149,081
Georgia	99,465	91,717	88,606	93,521	94,670
Hawaii	17,169	16,356	13,528	13,916	13,540
Idaho	16,900	17,592	16,320	16,740	15,060
Illinois	168,369	164,127	152,517	150,744	150,942
Indiana	83,068	79,177	78,244	80,283	80,556
Iowa	40,762	41,251	36,549	37,561	37,945
Kansas	37,979	38,496	33,180	33,604	32,974
Kentucky	52,808	50,794	53,568	52,287	52,449
Louisiana	73,119	68,706	66,069	64,695	64,152
Maine	19,280	17,766	15,663	16,396	16,229
Maryland	69,824	67,241	56,466	56,945	57,222
Massachusetts	77,920	76,685	67,194	68,869	71,645
Michigan	140,054	134,164	127,089	131,499	129,653
Minnesota	70,328	67,403	58,680	58,799	57,270
Mississippi	41,103	40,875	40,914	42,324	40,509
Missouri	73,326	73,944	67,163	68,593	68,825
Montana	12,275	12,705	12,463	11,790	12,588
Nebraska	24,854	25,422	22,808	22,948	22,195
Nevada	17,613	16,464	13,660	15,271	14,304
New Hampshire	16,124	15,899	12,372	13,575	13,647
New Jersey	98,314	100,230	95,582	94,338	97,641
New Mexico	25,845	25,533	23,052	21,591	22,524
New York	242,933	232,310	219,372	226,315	225,334
North Carolina	89,793	86,163	85,809	87,891	86,943
North Dakota	10,005	10,060	10,280	9,620	8,285
Ohio	158,732	156,799	147,675	147,913	148,955
Oklahoma	47,985	46,517	45,748	46,759	43,985
Oregon	40,334	42,728	37,950	37,167	38,035
Pennsylvania	156,238	155,317	143,928	151,208	149,598
Rhode Island	14,050	13,552	11,539	11,336	10,892
South Carolina	51,504	50,436	46,587	50,133	52,098
South Dakota	11,586	11,861	10,419	10,091	10,165
Tennessee	66,513	66,444	63,237	66,783	68,079
Texas	282,004	275,908	247,399	250,643	249,632
Utah	34,374	35,672	34,196	32,045	30,070
Vermont	8,906	8,190	6,583	7,342	7,387
Virginia	86,469	83,655	77,199	78,456	77,607
Washington	77,469	72,753	60,738	61,338	61,617
West Virginia	22,718	23,289	26,037	27,403	27,259
Wisconsin	76,148	73,375	67,257	66,507	66,880
Wyoming	8,295	8,254	7,730	6,431	6,761

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

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Table S23: Base populations for indicators using 1990 U.S. Census estimates, by population group (and indicator) and state: 1990 — Continued

	Population aged 17 (10, 23)	Population aged 18 (10, 11)	Population aged 19 (10)	Population aged 20 (10)	Population aged 21 (10)
Alabama	61,351	65,642	72,797	66,321	63,004
Alaska	7,314	7,319	7,349	8,236	7,275
Arizona	49,454	51,375	59,161	56,395	52,668
Arkansas	35,760	36,091	38,038	36,470	31,603
California	383,799	418,797	465,260	496,986	481,279
Colorado	41,490	45,612	51,252	48,348	46,287
Connecticut	39,793	42,467	49,273	52,430	48,623
Delaware	8,149	10,311	11,370	11,608	10,739
District of Columbia	6,616	9,520	12,878	13,072	11,505
Florida	155,297	159,870	175,684	169,917	163,240
Georgia	97,033	101,423	113,159	106,998	102,057
Hawaii	14,321	13,618	16,898	17,575	18,707
Idaho	15,188	16,128	16,116	15,320	11,768
Illinois	159,687	166,530	177,708	172,686	164,526
Indiana	81,339	86,365	99,092	92,582	82,605
Iowa	35,749	41,117	44,895	42,052	41,092
Kansas	31,901	34,250	40,524	37,477	36,508
Kentucky	54,374	57,050	63,222	60,042	54,716
Louisiana	64,716	66,318	70,899	66,240	62,601
Maine	16,347	18,455	19,450	18,566	16,601
Maryland	59,867	64,687	69,463	70,872	68,317
Massachusetts	75,795	88,808	105,642	105,469	101,101
Michigan	138,301	141,367	153,248	149,228	140,589
Minnesota	58,201	59,021	65,819	65,750	63,005
Mississippi	43,032	47,751	50,061	42,939	41,118
Missouri	68,139	73,903	84,549	74,503	70,702
Montana	11,420	11,233	10,412	9,777	10,210
Nebraska	21,181	23,254	24,221	22,861	21,337
Nevada	14,977	14,913	15,592	15,186	16,807
New Hampshire	14,111	15,693	17,172	17,829	16,026
New Jersey	102,443	100,521	107,835	108,542	106,720
New Mexico	21,330	22,440	23,271	22,065	20,835
New York	230,749	247,489	278,733	289,822	272,511
North Carolina	94,827	101,784	118,134	119,457	114,057
North Dakota	10,025	9,445	10,565	10,285	9,690
Ohio	156,413	161,908	175,228	164,718	160,211
Oklahoma	45,532	45,230	50,398	46,920	43,599
Oregon	36,949	36,814	40,001	39,728	37,192
Pennsylvania	154,989	171,952	193,018	189,610	173,719
Rhode Island	13,100	15,782	18,191	17,744	17,638
South Carolina	52,794	57,819	64,209	61,737	58,512
South Dakota	10,115	10,655	10,615	10,796	9,571
Tennessee	69,267	77,448	83,760	76,746	73,521
Texas	250,766	260,500	278,844	267,721	253,827
Utah	28,971	29,181	31,471	26,927	29,151
Vermont	8,184	9,078	10,550	10,111	10,597
Virginia	81,633	90,114	104,793	108,090	102,720
Washington	61,749	65,043	70,977	72,876	69,492
West Virginia	27,881	28,783	29,707	26,797	25,262
Wisconsin	65,156	66,967	77,038	76,106	73,348
Wyoming	7,186	6,225	6,687	6,469	5,099

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table S23: Base populations for indicators using 1990 U.S. Census estimates, by population group (and indicator) and state: 1990 — Continued

	Population aged 18-21 (12, 13)	Population aged 22-29 (12, 13)	Population aged 18-29 (12, 13)	Population aged 22 (24, 29)
Alabama	267,764	491,203	758,967	57,418
Alaska	30,179	74,431	104,610	7,265
Arizona	219,599	479,271	698,870	52,909
Arkansas	142,202	270,840	413,042	30,399
California	1,862,322	4,292,763	6,155,085	468,205
Colorado	191,499	420,582	612,081	44,031
Connecticut	192,793	432,490	625,283	45,803
Delaware	44,028	87,810	131,838	9,923
District of Columbia	46,975	99,076	146,051	11,080
Florida	668,711	1,565,222	2,233,933	163,978
Georgia	423,637	886,798	1,310,435	97,372
Hawaii	66,798	153,810	220,608	17,004
Idaho	59,332	105,616	164,948	12,304
Illinois	681,450	1,473,552	2,155,002	160,803
Indiana	360,644	683,551	1,044,195	78,316
Iowa	169,156	315,527	484,683	36,736
Kansas	148,759	302,233	450,992	32,857
Kentucky	235,030	464,341	699,371	53,748
Louisiana	266,058	520,971	787,029	59,835
Maine	73,072	147,775	220,847	17,092
Maryland	273,339	666,066	939,405	67,983
Massachusetts	401,020	859,068	1,260,088	97,103
Michigan	584,432	1,175,441	1,759,873	135,076
Minnesota	253,595	563,519	817,114	58,812
Mississippi	181,869	300,579	482,448	35,967
Missouri	303,657	620,460	924,117	64,625
Montana	41,632	81,521	123,153	9,716
Nebraska	91,673	190,626	282,299	19,987
Nevada	62,498	163,590	226,088	16,475
New Hampshire	66,720	145,255	211,975	15,537
New Jersey	423,618	999,523	1,423,141	106,792
New Mexico	88,611	184,545	273,156	18,453
New York	1,088,555	2,373,868	3,462,423	259,498
North Carolina	453,432	889,062	1,342,494	106,191
North Dakota	39,985	77,175	117,160	8,585
Ohio	662,065	1,331,271	1,993,336	154,430
Oklahoma	186,147	373,896	560,043	41,284
Oregon	153,735	320,822	474,557	35,021
Pennsylvania	728,299	1,399,749	2,128,048	161,410
Rhode Island	69,355	132,384	201,739	16,042
South Carolina	242,277	454,995	697,272	53,601
South Dakota	41,637	78,501	120,138	7,309
Tennessee	311,475	609,849	921,324	66,714
Texas	1,060.892	2,313,758	3,374,650	248,191
Utah	116,730	219,403	336,133	26,058
Vermont	40,336	68,314	108,650	8,173
Virginia	405,717	875,949	1,281,666	98,823
Washington	278,388	611,373	889,761	65,946
West Virginia	110,549	187,864	298,413	22,959
Wisconsin	293,459	607,323	900,782	68,528
Wyoming	24,480	49,650	74,130	5,029

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table S23: Base populations for indicators using 1990 U.S. Census estimates, by population group (and indicator) and state: 1990 — Continued

	Those aged 25-64 in the labor force having attained less than an upper secondary education (26)	Those aged 25-64 in the labor force having attained an upper secondary education (26)	Those aged 25-64 in the labor force having attained a non-university level of higher education (26)	Those aged 25-64 in the labor force having attained a university level of higher education (26)
Alabama	306,560	799,764	103,063	311,013
Alaska	21,414	138,617	20,023	64,174
Arizona	193,987	727,009	117,752	342,932
Arkansas	172,509	488,927	41,085	151,460
California	2,108,299	5,448,311	1,143,129	3,446,570
Colorado	137,204	738,343	117,917	461,448
Connecticut	177,853	667,739	114,405	481,392
Delaware	39,367	147,505	21,517	71,825
District of Columbia	47,346	100,265	8,914	109,405
Florida	870,829	2,553,238	436,540	1,131,095
Georgia	504,208	1,352,577	165,597	633,559
Hawaii	49,684	242,865	51,673	129,428
Idaho	48,173	209,648	34,309	80,858
Illinois	657,210	2,407,790	338,099	1,245,462
Indiana	326,965	1,305,859	151,702	431,457
Iowa	108,086	644,785	108,445	235,274
Kansas	102,121	559,149	67,632	262,457
Kentucky	277,668	748,235	75,523	252,456
Louisiana	280,110	799,415	63,440	319,845
Maine	61,230	285,150	40,978	114,551
Maryland	275,144	1,052,997	131,200	681,756
Massachusetts	302,307	1,160,610	227,036	875,260
Michigan	445,884	2,034,757	311,871	808,436
Minnesota	150,104	1,009,149	193,762	501,927
Mississippi	209,478	455,399	60,369	176,429
Missouri	289,300	1,145,810	116,674	462,715
Montana	30,166	179,189	21,463	78,096
Nebraska	58,053	371,547	56,716	151,259
Nevada	82,270	315,050	37,343	95,214
New Hampshire	54,338	252,525	47,876	138,898
New Jersey	466,281	1,593,497	210,295	1,043,405
New Mexico	86,138	297,540	35,378	141,335
New York	1,094,454	3,376,607	610,049	2,175,257
North Carolina	547,124	1,392,744	237,508	581,452
North Dakota	26,483	125,717	31,964	57,717
Ohio	574,697	2,413,158	293,456	926,874
Oklahoma	174,356	667,502	78,047	271,491
Oregon	128,197	626,756	98,386	293,909
Pennsylvania	608,958	2,572,196	319,674	1,109,645
Rhode Island	69,731	194,780	34,926	110,378
South Carolina	161,897	326,476	49,722	115,888
South Dakota	33,341	150,275	24,532	57,666
Tennessee	393,161	1,032,871	101,363	400,738
Texas	1,264,382	3,312,914	421,886	1,671,986
Utah	57,207	324,063	53,671	155,743
Vermont	27,668	122,241	19,756	68,047
Virginia	423,700	1,288,386	175,275	787,044
Washington	190,390	1,061,206	193,906	558,840
West Virginia	106,661	355,729	31,950	107,039
Wisconsin	223,547	1,145,775	182,741	436,684
Wyoming	19,653	107,997	15,622	40,031

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table S23: Base populations for indicators using 1990 U.S. Census estimates, by population group (and indicator) and state: 1990 — Continued

	Females aged 25-64 having attained less than an upper-secondary education (27, 28)	Males aged 25-64 having attained less than an upper-secondary education (27, 28)	Females aged 25-64 having attained an upper secondary education (27, 28)	Males aged 25-64 having attained an upper secondary education (27, 28)
Alabama	264,993	254,601	553,683	471,655
Alaska	16,233	18,306	81,437	91,834
Arizona	167,683	161,108	506,993	449,598
Arkansas	146,194	146,194	332,219	294,610
California	563,684	582,830	1,768,999	1,537,482
Colorado	105,542	105,542	483,114	428,421
Connecticut	128,159	133,390	439,731	374,585
Delaware	29,071	31,493	97,137	82,747
District of Columbia	38,946	37,419	68,932	56,399
Florida	680,335	680,335	1,790,583	1,525,311
Georgia	401,791	386,034	885,019	784,829
Hawaii	41,145	36,487	149,917	149,917
Idaho	34,833	39,279	142,453	126,327
Illinois	511,163	532,027	1,625,259	1,384,479
Indiana	263,682	263,682	854,451	757,721
Iowa	80,636	90,929	408,888	377,435
Kansas	78,186	81,378	358,960	331,348
Kentucky	256,711	267,190	508,416	450,859
Louisiana	264,255	264,255	583,357	496,934
Maine	47,177	53,200	185,347	171,090
Maryland	210,657	219,256	685,082	583,589
Massachusetts	232,544	232,544	759,412	673,440
Michigan	382,187	414,035	1,400,547	1,241,994
Minnesota	107,887	126,651	632,238	583,604
Mississippi	181,074	173,973	315,276	268,569
Missouri	245,905	236,262	759,099	673,164
Montana	23,630	26,647	121,011	111,702
Nebraska	41,590	45,056	235,615	217,491
Nevada	58,764	58,764	194,476	194,476
New Hampshire	35,970	40,562	159,331	141,294
New Jersey	353,243	353,243	1,075,610	916,261
New Mexico	81,440	75,175	203,580	187,920
New York	927,504	927,504	2,368,010	2,017,194
North Carolina	391,969	424,634	917,173	781,295
North Dakota	17,793	23,587	82,750	76,385
Ohio	513,122	513,122	1,639,710	1,454,082
Oklahoma	153,313	147,300	459,450	407,436
Oregon	98,151	102,157	425,872	377,661
Pennsylvania	524,964	524,964	1,803,878	1,536,636
Rhode Island	51,273	51,273	129,853	110,616
South Carolina	124,536	124,536	211,015	187,127
South Dakota	22,393	27,370	93,464	89,798
Tennessee	327,635	327,635	697,188	593,901
Texas	1,003,478	1,003,478	2,222,588	1,970,974
Utah	44,886	43,125	224,352	191,114
Vermont	17,757	23,538	76,585	70,693
Virginia	312,886	338,960	848,449	722,753
Washington	156,057	156,057	707,471	653,050
West Virginia	116,142	120,883	265,544	235,483
Wisconsin	160,674	188,618	726,589	670,698
Wyoming	14,591	15,186	69,720	66,985

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

Table S23: Base populations for indicators using 1990 U.S. Census estimates, by population group (and indicator) and state: 1990 — Continued

	Females aged 25-64 having attained a non-university level of higher education (27, 28)	Males aged 25-64 having attained a non-university level of higher education (27, 28)	Females aged 25-64 having attained a university level of higher education (27, 28)	Males aged 25-64 having attained a university level of higher education (27, 28)
Alabama	65,155	53,308	162,575	190,849
Alaska	11,071	12,485	32,800	38,504
Arizona	72,354	69,516	173,437	220,738
Arkansas	28,368	20,543	81,823	92,269
California	710,045	637,766	1,725,899	2,194,895
Colorado	70,479	65,058	233,316	285,165
Connecticut	78,487	54,542	248,809	292,081
Delaware	14,429	10,885	37,123	43,579
District of Columbia	5,908	4,457	60,781	60,781
Florida	291,026	228,664	578,700	736,527
Georgia	104,688	85,653	327,457	384,407
Hawaii	29,610	28,449	68,350	77,075
Idaho	22,056	18,788	38,105	54,835
Illinois	213,741	174,879	643,722	755,673
Indiana	93,090	79,299	218,152	266,631
Iowa	72,707	50,526	120,251	141,164
Kansas	42,756	34,982	132,703	162,193
Kentucky	53,311	35,540	130,483	153,175
Louisiana	45,860	30,574	172,790	194,848
Maine	25,906	21,195	63,067	65,642
Maryland	88,975	61,830	348,453	409,054
Massachusetts	155,757	108,238	462,216	521,222
Michigan	201,799	165,108	413,405	505,272
Minnesota	118,899	101,285	248,206	303,362
Mississippi	41,683	30,185	96,234	104,253
Missouri	74,617	61,051	233,957	285,947
Montana	14,645	10,605	40,394	49,371
Nebraska	34,159	30,292	77,310	90,756
Nevada	21,527	22,406	44,361	63,837
New Hampshire	29,923	24,482	70,229	85,836
New Jersey	147,707	102,644	527,564	644,801
New Mexico	23,017	19,607	73,954	90,389
New York	409,092	308,613	1,186,504	1,285,379
North Carolina	151,141	118,754	310,548	350,193
North Dakota	18,737	18,003	29,831	35,019
Ohio	194,500	146,728	468,644	572,787
Oklahoma	48,315	44,598	135,745	172,767
Oregon	59,734	57,392	152,022	185,804
Pennsylvania	210,609	165,478	567,432	693,528
Rhode Island	21,432	18,257	57,049	66,971
South Carolina	30,511	25,991	60,578	71,113
South Dakota	16,919	11,279	29,150	34,219
Tennessee	68,361	49,503	207,123	243,144
Texas	258,095	238,242	835,993	1,063,991
Utah	32,979	31,685	72,438	108,658
Vermont	12,944	9,764	37,464	38,993
Virginia	114,835	86,630	406,787	477,532
Washington	120,037	110,804	279,420	355,626
West Virginia	23,767	15,196	57,168	64,467
Wisconsin	109,644	93,401	225,702	264,954
Wyoming	9,925	8,454	20,016	25,474

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing.

GLOSSARY

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Apprenticeship: In calculating the indicators, *youth apprenticeship* programs are generally classified as belonging to formal education. Such programs typically involve an alternation between learning in an educational institution (ordinary or specialized) and learning through work experience programs, which may include highly organized training in a firm or with a craftsperson. The apprentices and the firm (or craftsperson) are bound by a legal agreement. Even though only a part of the training occurs in schools, it is considered as a full-time educational activity, because it covers both theoretical and practical training. Youth apprenticeship programs are classified as technical or vocational programs in upper secondary education.

Bachelor's degree: A degree granted for the successful completion of a baccalaureate program of studies, usually requiring at least 4 years (or equivalent) of full-time college-level study. This includes degrees granted in a cooperative or work-study program.

Bonferoni: The Bonferoni adjustment is used in making statistical comparisons of values that are sample estimates when *multiple* comparisons, based on multiple samples, are being made. The procedure involves an adjustment to the test of statistical significance, by dividing the *alpha* level of the significance test into $n(n-1)/2$ categories, where n represents the number of countries being compared. (See the Note on standard errors, pp. 302-305)

Center for Educational Research and Innovation (CERI): The CERI is an organization within OECD that promotes and conducts cooperative educational research activities among the OECD member nations.

Comprehensive schools: The schools offer a general curriculum, rather than a curriculum intended to prepare students for specific occupations, types of higher education, or training. In most cases, students within a comprehensive school may choose courses that serve such a purpose, but comprehensive schools as a whole serve students with a variety of career and educational plans. (See *Differentiated schools*.)

Confidence interval: This is an interval of values within which there is a specified probability that the true value lies. For example, in the case of a 95 percent confidence interval, there is a 95 percent probability that the true value lies within the interval.

Constant dollars: Dollar amounts that have been adjusted by means of price and cost indexes to eliminate inflationary factors and allow direct comparison across years.

Consumer price index (CPI): This price index measures the average change in the cost of a fixed market basket of goods and services purchased by consumers.

Current dollars: Dollar amounts that have not been adjusted to compensate for inflation.

Current expenditures: These expenditures represent educational goods and services whose lifespan should not, in theory, exceed the current year, such as salaries of staff, educational supplies, scholarships, minor repairs and maintenance, and administration. Conventionally, minor items of equipment are treated as current expenditure, even if the corresponding physical asset lasts longer than one year. Current expenditures exclude *capital expenditures*, which are for assets that will be used for many consecutive years, such as buildings, major repairs, major items of equipment, and vehicles, even if the financing of such assets is reported in a single financial year.

Differentiated schools: These are secondary schools offering a particular type of curriculum, such as college preparatory or vocational. For example, secondary school students in Germany enroll in differentiated schools, including those that prepare them to enter apprenticeship programs or those that prepare them for university education. (See *Comprehensive schools*.)

Early childhood education: Early childhood education (public and private) may either be part-time or full-time and can cover young children participating in a program intended to foster learning as well as emotional and social development. Early childhood education is not compulsory in most countries. Pupils enrolled in schools or programs organized by ministries other than Education (for example, Health or Social Affairs) are included, if the educational development of the pupils is the main objective. Day nurseries, child-care centers and similar institutions that predominantly provide custodial care are not included. It is acknowledged, however, that in certain countries it may be difficult to distinguish between the various programs.

Earnings: Earnings refer to annual money earnings, (i.e., direct pay for work before taxes). Income from other sources, such as government aid programs, interest on capital, etc., is not taken into account. Mean earnings are calculated on the basis of data only for all people with income from work.

Educational attainment: This is the highest grade, year, or level of regular school attended and completed.

Educational expenditures: These expenditures are the sum of expenditures on instruction, research, public service, academic support, student services, institutional support, operation and maintenance of plant, and awards from restricted and unrestricted funds.

Employment: Includes civilian, noninstitutionalized persons who (1) worked during any part of the survey week as paid employees; worked in their own business, profession, or farm; or worked 15 hours or more as unpaid workers in a family-owned enterprise; or (2) were not working but had jobs or businesses from which they were temporarily absent due to illness, bad weather, vacation, labor-management dispute, or personal reasons whether or not they were seeking another job.

Enrollment: The total number of students registered in a given school unit at a given time, generally in the fall of a year.

Enrollment reference group: The people in the age range typical for attendance in an educational level, starting at the typical starting age for that level and continuing through the typical years of duration, as identified by each country.

Expenditure: (See *Note on international comparisons of current public education expenditures*, pp. 235-242)

Fiscal year: The yearly accounting period for a government or firm, which may or may not coincide with the calendar year. For the U.S. federal government it begins on October 1 and ends on the following September 30. The fiscal year is designated by the calendar year in which it ends; for example, fiscal year 1992 begins on October 1, 1991, and ends on September 30, 1992.

Full-time/Part-time enrollment: Students are enrolled full-time, should they attend a program that is classified as such by the institution. Otherwise, they are considered part-time students. In the United States, higher education students are enrolled full-time if their total course load is equal to at least 75 percent of the normal full-time course load. In some countries, no distinction is made between full-time and part-time students at certain levels.

Full-time-equivalent (FTE) enrollment: For institutions of higher education, the enrollment of full-time students, plus the full-time equivalent of part-time students as reported by institutions equals the FTE. In the absence of an equivalent reported by an institution, the FTE enrollment is estimated by adding one-third of part-time enrollment to full-time enrollment.

G-7 countries: See *Group of Seven.*

Graduate: An individual who has received formal recognition for the successful completion of a prescribed program of studies.

Graduation: Formal recognition given an individual for the successful completion of a prescribed program of studies.

Graduation reference age: This is the age identified by each country as the typical age at which students graduate from a given level of education or educational program. Used to construct graduation ratios.

GDP/GSP per capita: The GDP of a country or GSP of a state divided by its total population yields GDP/GSP per capita.

Gross domestic product (GDP): The gross domestic product (GDP) is equal to the total of the gross expenditure on the final uses of the domestic supply of goods and services valued at a price to the purchaser minus the imports of goods and services. The gross state product (GSP) is the analogous measure for states.

Gross state product (GSP): See *gross domestic product.*

Group of Seven (G-7): This group is composed of seven industrialized nations with large economies: Canada, France, Italy, Japan, the United States, the United Kingdom, and Germany. Those countries are, coincidentally, all members of the OECD. *However, the G-7 and the OECD are not related organizations.*

Higher education: This form of education includes study beyond secondary school at an institution that offers programs terminating in an associate, baccalaureate, or higher degree, or equivalent degrees in other countries.

Indicators of Education Systems Project (INES): INES refers to the specific office within CERI and the OECD that is responsible for producing the *Education-at-a-Glance* series of reports (see CERI and OECD).

Initial source of funds: The sectors or levels of government that *generate* the funds used to finance education. The figures do not reflect subsequent transfers among levels of government or between the public and private sectors — for example, intergovernmental transfers from the central government to regional or local governments or transfers (such as scholarships) from governments to private parties. These transfer payments are often large and important.

International Assessment of Educational Progress (IAEP): See entry for *Educational Testing Service* in *Sources of Data* section.

Labor force: Persons aged 15 to 64 either employed or actively seeking work, comprise a labor force.

Lower secondary education: Education equivalent to middle school or junior high school in the United States.

Migration: Geographic mobility involving a change of usual residence between clearly defined geographic units, that is, between counties, states, or regions.

National Assessment of Educational Progress (NAEP): The National Assessment of Educational Progress (NAEP) is a Congressionally mandated study funded by the Office of Educational Research and Improvement, U.S. Department of Education. The overall goal of the project is to determine the nation's progress in education. To accomplish this goal, a cross-sectional study was designed and initially implemented in 1969. Periodically, NAEP has gathered information about levels of educational achievement across the country. NAEP has surveyed the educational accomplishments of 9-, 13-, and 17-year-old students (and in recent years, grades 4, 8, and 12), and occasionally young adults, in 10 learning areas. Different learning areas were assessed annually and, as of 1980–81, biennially. Most areas have been periodically reassessed in order to measure possible changes in education achievement.

National Education Goals: In the United States, the six national goals in education adopted by the President and the nation's governors in 1989 are called National Education Goals. The 1994 Goals 2000 — Educate America Act, passed by the Congress added 2 more goals, bringing the total number of goals to eight.

Net enrollment rate: Measures the percentage of persons in a particular age range who are enrolled in school or at a particular level of education.

Non-university higher education: In some systems, the programs at this level (those not leading to a university degree or equivalent) do not lead on to other programs in higher education; in other systems, such programs allow students who successfully complete their studies to proceed to university degree programs in the same field. The term "articulation" is used to distinguish the latter type of program from the former, "terminal," one. For example, the "Associate Degree," awarded after two years of study in the United States, is not regarded as a university degree for international purposes but, rather, as a non-university higher education degree. This also applies to the *diplôme d'études universitaires générales* (DEUG) in France.

Organization for Economic Co-operation and Development (OECD): The OECD is an organization of 24 nations whose purpose is to promote trade and economic growth in both member and non-member nations. OECD's activities cover almost all aspects of economic and social policy. The member countries in 1991 were: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. Greece and Iceland did not participate in the data compilation for ***Education at a Glance***; therefore, their data are not included in this report. Czechoslovakia and Hungary had applied for membership in the OECD at the time of the data compilation for ***Education at a Glance***.

Part-time enrollment: See *Full-time/Part-time enrollment*.

Poverty: This report uses the following definition: one can be said to be living in poverty if one lives in a household whose income (adjusted for household size) is less than 40 percent the country's median household income.

Preprimary education: Preprimary education (public and private) may either be part-time or full-time and can cover young children participating in programs intended to foster learning and emotional and social development. Preprimary education is not compulsory in most countries. Day nurseries, child care centers, and similar institutions that predominantly provide custodial care are not included. In some countries, it is difficult to distinguish among the various programs.

Primary education: This includes all forms of education prior to secondary education and after preprimary (such as kindergarten, or nursery school) education. It is equivalent to elementary education in the United States.

Private expenditures: This includes expenditures funded by private sources — mainly households, private non-profit institutions, and firms and businesses. Private expenditures include school fees, materials such as textbooks and teaching equipment, transport to school (if organized by the school), meals (if provided by the school), boarding fees, and expenditure by employers for initial vocational training.

Private schools or institutions: Schools or institutions that are organized and controlled independently of public authorities, even though they may receive public funding.

Public education expenditures: Include funds channeled to both public and private schools by federal, state, and local governments, either directly or through students. This includes expenditures at public schools funded by public sources and subsidies (such as loans and grants) to students at private schools from government agencies. Expenditures in the general education system by public agencies other than education departments, ministries, or boards are generally included. Expenditures on education and training within departments, ministries, or boards that are not directly related to education ministries or departments are generally not included.

Public expenditures: These are expenditures funded by public authorities at all levels and in all sectors.

Public expenditures per student: Calculated as current public expenditure for education divided by enrollment in both public and private schools. This is a measure of average public investment per student in the education system. It is not a measure of total resources a student receives, which would include private expenditures.

Public and private schools: *Public schools* are organized by public authorities. They normally provide open access without any distinction of race, sex, or religion. *Private schools* are normally organized independently of the public authorities, even though they may receive a small amount of public funding. *Private schools predominantly publicly funded* are schools that obtain most of their funding from public authorities, even though these schools are not formally part of the public school sector. Publicly funded private schools (such as "charter" schools) were rare in the United States in 1991, but fairly common in Europe.

Public schools or institutions: Schools or institutions organized and controlled by public authorities. They normally provide open access without any distinction of race, sex, or religion.

Pupil-teacher ratio: The enrollment of pupils at a given period of time, divided by the full-time-equivalent number of classroom teachers serving these pupils during the same period.

Purchasing Power Parity Index (PPPI): The PPPI is composed of the rates of currency conversion that equalize the purchasing power of different currencies. This means that a given sum of money, when converted into different currencies at the PPPI rates, will buy the same basket of goods and services in all countries.

Standard error: An estimate of the error of an estimation due to sampling, based on the number of observations and their distances from their mean.

Student: An individual for whom instruction is provided in an educational program under the jurisdiction of a school, school system, or other education institution. No distinction is made between the terms "student" and "pupil," though "student" may refer to one receiving instruction at any level while "pupil" refers only to one attending school at the elementary or secondary level. A student may receive instruction in a school facility or in another location, such as at home or in a hospital. Instruction may be provided by direct student-teacher interaction or by some other approved medium such as television, radio, telephone, and correspondence.

Theoretical age group: In classifying education by level, there is an assumption that, at least for the regular school (and, in most cases, university) system, a student can proceed through the system in a standard number of years. If it is assumed that the student starts school at the modal age and does not repeat any year, then the ages at which a student begins and completes each cycle or level can be calculated. These are the theoretical age ranges that correspond to each level in the school system. See Table S5 in the "Supplemental Notes" for a specific description by country.

Unemployment rate: The percentage of the labor force without work and actively seeking work yields the unemployment rate.

University: University education is defined here as education leading to a 4-year undergraduate degree or graduate degree.

Upper secondary education: This is a level of education equivalent to high school in the United States. Upper secondary education may include general, technical, or vocational education.

SOURCES:

Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at a Glance*, Paris, Author, 1993.

The McGraw-Hill Dictionary of Modern Economics, New York: McGraw-Hill, 1975.

Pearce, David W., *The Dictionary of Modern Economics*, Cambridge, Massachusetts: The MIT Press, 1981.

Shryock, H.S., and Siegel, J.S., *The Methods and Materials of Demography*, Washington, D.C.: U.S. Government Printing Office, 1975.

U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P-20 "School Enrollment-Social and Economic Characteristics of Students: October 1990 and 1991."

U.S. Department of Education, National Center for Education Statistics, *Combined Glossary: Terms and Definitions From the Handbook of the State Educational Records and Reports Series*, Washington, D.C.: U.S. Government Printing Office, 1974.

U.S. Department of Education, National Center for Education Statistics, *The Condition of Education 1994*, Washington, D.C.: U.S. Government Printing Office, 1994.

U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics 1994*, Washington, D.C.: U.S. Government Printing Office, 1994.

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Advisory Commission on Intergovernmental Relations

Significant Features of Fiscal Federalism, 1993

The U.S. Advisory Commission on Intergovernmental Relations seeks to facilitate the smooth management of affairs at the interstices of authority between separate branches and levels of government in the United States. Created by the U.S. Congress, the Commission includes members from both houses of that body, from the executive branch of the Federal government, and from among the state governors and legislators, city mayors, and county officials. The Commission publishes many reference documents, primarily in the area of law and public finance. *Significant Features of Fiscal Federalism, 1993* covers 500 pages, with tables, in two volumes, one focusing on budget processes and tax systems and the other on revenues and expenditures. The periodic volumes of *Significant Features* document changes in government tax rates and revenue shifts in intergovernmental fiscal relationships, the types and costs of government services and which governments provide them, and the economic and demographic changes that affect government operations.

American Federation of Teachers

How U.S. Teachers Measure Up Internationally: A Comparative Study of Teacher Pay, Training, and Conditions of Service

The study is based on national salary schedules and statistical salary data collected from foreign embassies in the United States, U.S. embassies abroad, teacher unions abroad, and foreign government education statistical agencies. Other sources include the World Confederation of the Organizations of Professional Teachers (WCOPT) studies of 1986 and 1991, the International Federation of Free Teachers Unions (IFFTU) 1991 study, and a 1988 report of teacher pay and working conditions in the European Community conducted by the Commission of the European Communities and the Netherlands Ministry of Education. Tables, figures, and text present comparative information for the United States and 18 other economically-advanced nations pertaining to teacher training, working conditions, and benefit structures; teacher salary structure; and teacher salary levels. Data for individual countries range from 1990 to 1992. For some indicators, absolute comparability of data is limited due to intercountry differences in definitions and classifications.

Survey and Analysis of Salary Trends, 1993

The American Federation of Teachers (AFT), a national teachers' union with a 1994 membership of 850,000, produces this survey annually. Data for the 1993 report were collected from state departments of education, other state, federal, and international agencies, and research organizations. Data include national average salaries or earnings for teachers, other school employees, government workers, and professional employees over the past 30 years. In many instances, these data are available by state for recent years. The first section of this report focuses on state comparisons. The second section highlights trends in national averages over the past two or three decades. The third section focuses on beginning teachers, with supplemental information on experienced teachers reentering the profession and teacher retirement. The fourth section presents a summary of results from AFT's newly released international teacher salary study, *How U.S. Teachers Measure Up Internationally: A Comparative Study of Teacher Pay, Training, and Conditions of Service.*

Annie E. Casey Foundation and the Center for the Study of Social Policy

Kids Count Data Book

The *Kids Count Data Book* has been produced annually for the last four years by the Annie E. Casey Foundation, a philanthropy devoted exclusively to disadvantaged children, and the Center for the Study of Social Policy, a nonprofit research and policy analysis organization. The publication compares state statistical trends between 1985 and 1990 based on ten indicators of socioeconomic status, health, and education for youth and adolescents. Background demographic information is given for the United States and for each state. International comparisons are also included for eight of the ten indicators. The report uses both government and private sources of data; reports produced by The Center for the Study of Social Policy provide much of the private data. The child poverty data from *Kids Count* that are used in this report are based on U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March, 1991.

Asia Pacific Economic Cooperation

Education Profiles

This publication presents statistical and descriptive profiles of the education systems in 15 countries and territories located in the Asia Pacific region. Data are presented on population, school enrollment, number of schools, finance, the structure and governance of schools at each level of schooling, curriculum and standards, choice and decentralization, and current reform efforts. The countries and territories included are: Australia, Brunei Darussalam, Canada, People's Republic of China, Hong Kong, Indonesia, Japan, Republic of Korea, Malaysia, New Zealand, Republic of the Philippines, Singapore, Chinese Taipei, Thailand, and the United States. Sources of information for the report include data provided by national ministries of education, publications of international organizations, reports produced by the U.S. Department of Education and the U.S. Department of Commerce, and works produced by private individuals. The data presented are meant to be used as general indicators of the condition of education in a nation or territory. Strict cross-national comparisons of precise numbers are discouraged due to the risk of incorrect assumptions and inconsistency across countries in their definitions of certain variables.

Bureau of the Census
U.S. Department of Commerce

1990 Census of Population and Housing

The decennial census includes two levels of data; one collected through a short form, and one through a long form. The short form questionnaire is referred to as the "100-percent questions," since it is distributed to the entire population. A representative sample of U.S. households receives a longer questionnaire which includes all the questions found on the short form plus additional sample questions. Data on educational attainment, enrollment, labor force status, and income—the Census information used in this report—come from the sample component of the 1990 census — the long form.

Public Use Microdata Samples (5 percent). The Public Use Microdata Samples (PUMS) are a compilation of records representing either 5 percent or 1 percent samples of the housing units in the U.S. and the persons inhabiting them. Data are reproduced directly from household surveys completed as part of the decennial Census conducted by the Bureau of the Census. The full Census long form sample component is based on questionnaires sent to approximately 15.9 percent of all housing units in the U.S. The 5 percent PUMS sample comprises, then, about a third of the long form respondents. Data in PUMS are broken down by individual household, and include a 231-character record for each housing unit and each person residing within the unit. All U.S. states, and various subdivisions of states with greater than 100,000 inhabitants, are represented in the 5 percent sample. The data used in PUMS are edited for confidentiality, limiting detail on place of residence, place of work, and high incomes.

Education in the United States. Produced in 1994 as part of the 1990 Census of Population series of reports, *Education in the United States* provides an overview of participation in education in the United States. Data on educational attainment, school enrollment, and earnings are presented, broken down by age, sex, race, Hispanic origin, and type of school. Both national and state-level data are included. Data presented in the report are based on responses to the long form of the 1990 U.S. Census.

Social and Economic Characteristics: United States. Three series of reports - *1990 Census of Population, 1990 Census of Housing, and 1990 Census of Population and Housing* - summarize the data collected during the 1990 U.S. census. Issued in 1993 as part of the *1990 Census of Population* series, *Social and Economic Characteristics: United States* is a compilation of tables presenting data on employment, race, citizenship, age, sex, family composition, education, veteran status, and income for the United States. Data in the 189 tables are broken down by social and economic characteristics, as well as by geographic region, state, metropolitan area, urbanized area, and American Indian/Alaska area.

Current Population Survey

Current estimates of school enrollment and social and economic characteristics of students are based on data collected in the Census Bureau's monthly household survey of about 60,000 households, the CPS. The CPS covers 729 sample areas consisting of 1,973 counties, independent cities, and minor civil divisions throughout the 50 states and the District of Columbia. The current sample was selected from 1980 census files and is periodically updated to reflect new housing construction.

School Enrollment. Each October, the CPS includes supplemental questions on the enrollment status of the population aged 3 and older. Annual reports documenting school enrollment of the population have been produced by the Bureau of the Census since 1946. The pertinent reports for this work are *Current Population Reports*, Series P-20, Nos. 460 and 469, *School Enrollment—Social and Economic Characteristics of Students:* October 1990 and October 1991. All sample surveys are subject to sampling and nonsampling error. The main sources of nonsampling error in the supplement are those inherent in any household survey. When a household respondent reports for all individuals in the household, is that person knowledgeable about the grade or level of school, type of school, or full-time status? In addition, some analysts believe social acceptability of response causes biased reporting, such as reluctance to report lack of a high school diploma; some dismiss it. Household-reported data may not be consistent with administrative data because definitions may not be the same.

Statistical Abstract of the United States

First published in 1878, the *Statistical Abstract of the United States* is an annual publication containing statistics on finance, education, industry, health, and population for the United States. Current volumes also include a small section of international comparative statistics. Although they primarily present national data for the United States, each volume also contains some data at the state, regional, and metropolitan levels. Some of the data used in each publication are taken from the household survey information of the U.S. Census Bureau. Other data are provided predominantly by other divisions of the U.S. Department of Commerce and by other federal government agencies.

Bureau of Economic Analysis
U.S. Department of Commerce

Survey of Current Business

First produced in 1921, the *Survey of Current Business* is a monthly report of national economic measures. Included in the report are quarterly national income and product accounts tables, business cycle indicators, current business statistics, and summaries of the Bureau of Economic Analysis' (BEA) work pertaining to international, national, and regional economic accounts. Data for the publication are collected from the BEA or other government statistical agencies.

Bureau of Labor Statistics
U.S. Department of Labor

Office of Productivity and Technology

The Office of Productivity and Technology's unpublished tables entitled "Comparative Real Gross Domestic Product Per Capita and Per Employed Person" present national data for thirteen OECD countries and Korea. The tables provide comparisons based on purchasing power parities (PPPIs) and benchmarked to 1985 and 1990 studies. The studies were conducted jointly by the OECD and EUROSTAT (the Statistical Office of the European Community) as part of the United Nations International Comparison Project (UNICP). Information for each benchmarked year includes data for GDP, GDP per capita, and GDP employed per person, indexed to the U.S. and in U.S. dollars. PPPIs and relative prices are also given, with PPPIs for GDP and comparative price levels indexed to the U.S. The tables also present GDP trends, implicit price deflators for GDP, and population and employment measures.

Center for Educational Research and Innovation Organization for Economic Co-operation and Development

(See also later entry under *Organization for Economic Co-operation and Development*)

International Indicators Project

The International Indicators Project was initiated in the late 1980s by the Center for Educational Research and Improvement (CERI) of the Organization for Economic Co-operation and Development (OECD) in response to the demand for comparative information on education in the OECD member nations. The project develops and reports on indicators of participation, attainment, and finance, learning outcomes, education and the labor market, the functioning of schools and school systems, and attitudes toward education. In 1992, CERI published the first edition of *Education at a Glance*, which contained 36 indicators. Updated and expanded editions were published in 1993 and 1995, and subsequent volumes hereafter will be published on a regular basis.

The International Indicators Project relies on participating nations to report much of the data themselves. As the project is still in its early stages, some issues of uniformity of reporting procedures remain unresolved.

Child Trends, Inc.

Facts at a Glance

Facts at a Glance has been published annually since 1983 by Child Trends, Inc., a nonprofit organization specializing in demography and statistics on teen pregnancy. Drawing on both public and private sources of data, the report presents natality statistics for the United States at the national, state, and metropolitan levels. Data are broken down by geographic region, age, and race. The teen birth rate data from *Facts at a Glance* that are used in this report are based on U.S. Department of Health and Human Services, National Center for Health Statistics, *Vital Statistics for the United States, 1990, Vol. 1, Natality.*

Educational Testing Service

Educational Standards in the 50 States: 1990

This report is the third in a series tracking state educational standards since 1984-85. The report includes both a general summary of state-prescribed standards across the states and a more detailed description of standards in each of the 50 states for the 1989-90 school year. Changes in state mandates since 1984-85 are also documented. Individual state profiles present information on state standards for students (testing, high school graduation requirements, attendance and other policies); for teachers (teacher preparation, certification and licensing, and staff development); for schools and school districts (minimum length of the school year and school day and curriculum requirements); and for public school choice programs. Tables providing state-by-state comparisons across these topical areas are also included.

IAEP/NAEP Cross-Linking Study

(See later entry under *National Center for Education Statistics*)

International Assessment of Educational Progress

In 1990–91, as part of an international effort coordinated by the Educational Testing Service, a total of 20 countries assessed the mathematics and science achievement of 13-year-old students and 14 of the 20 countries assessed 9-year-old students in those same subjects. Some countries assessed virtually all age-eligible children in the appropriate age group; others confined their samples to certain geographic regions, language groups, or grade levels. The definition of populations often followed the structure of school systems, political divisions, and cultural distinctions. In some countries, significant proportions of age-eligible children were not represented because they did not attend school. Also, in some countries, low rates of school or student participation mean results may be biased.

Typically, a random sample of 3,300 students from about 110 different schools was selected from each population at each age level; half were assessed in mathematics and half in science. A total of about 175,000 9- and 13-year-olds (those born in calendar years 1981 and 1977, respectively) were tested in 13 different languages in March, 1991.

The achievement tests lasted one hour. The tests given to 9-year-olds included 62 questions in mathematics and 60 questions in science. Those for 13-year-olds included 76 questions in mathematics and 72 questions in science. In addition, students of each age spent about 10 minutes responding to questions about their backgrounds and home and school experiences. School administrators completed a school questionnaire.

Learning Mathematics

This is the published report of results of the assessment of mathematics achievement conducted through the *International Assessment of Educational Progress*. In 1991, 9- and 13-year-old participants in 20 countries were given a mathematics achievement test consisting of 62 and 72 questions, respectively. Students and school administrators also responded to questionnaires probing their classroom practices, study habits, and behavior at home. *Learning Mathematics* provides comparative achievement results as well as indicators of cultural and educational differences across the 20 countries reporting data. For a more accurate interpretation of results, it is important to evaluate achievement findings in the context provided by the descriptive data. Other areas of concern regarding data comparisons are the appropriateness of measures to a country's curricula, and the representativeness of target populations. Results are presented separately for two groups: comprehensive populations and populations with exclusions or low participation. Tables include percentages of questions that groups of students answered correctly, percentile distributions within nations, and estimates of sampling error. *Learning Science*, a companion volume, focuses on the science subtest of the *International Assessment of Educational Progress*.

General Accounting Office

(See later entry under *United States General Accounting Office*)

Luxembourg Income Study

The Luxembourg Income Study (LIS) began in 1983 as a joint project sponsored by the government of Luxembourg and the Center for Population, Poverty and Policy Studies (CEPS) in Walferdange, Luxembourg. Created to compile and provide access to an international database containing primarily country-level social and economic data based on household surveys, the project receives its current funding from CEPS and the International Networks for Studies in Technology, Environment, and Alternative Development (INSTEAD) and the national science foundations of its member nations. Along with its office in Walferdange, divisions of LIS are housed at Syracuse University and Harvard University in the United States. Timothy Smeeding at Syracuse University's Maxwell School is primarily responsible for the comparative child poverty measure.

As of 1993, LIS membership consisted of 23 countries in Europe, North America, and Australia, with applications pending for Korea, Finland, Mexico, Portugal, and Taiwan. Data are provided by individual nations and cover the period from 1968 to 1989. Each study conducted by LIS is produced in the form of a working paper, of which there are now more than 100. LIS reports are also published in books, articles, and dissertations.

National Center for Education Statistics
U.S. Department of Education

Common Core of Data

The National Center for Education Statistics (NCES) uses the Common Core of Data (CCD) survey to acquire and maintain statistical data on the 50 states, the District of Columbia, and the outlying areas from the universe of state-level education agencies. Information about staff and students is collected annually at the school, LEA (local education agency or school district), and state levels. Information about revenues and expenditures is also collected at the state level. Data are collected for a particular school year (July 1 through June 30) via survey instruments sent to the states by October 15 of the subsequent school year. States have two years in which to modify the data originally submitted.

Common Core of Data Finance Survey

The source of U.S. data for the elementary and secondary education finance data in this report is "The National Public Education Financial Survey" of the CCD series. The survey is one component of the Common Core of Data (CCD) surveys conducted annually by NCES, which provide basic descriptive information regarding the numbers of students and staff and the financing of public elementary and secondary schools. In compiling these fiscal data from administrative record systems, each state education agency (SEA) obtains data from the local education agencies (LEAs) that operate public schools. Each SEA may edit or examine the individual LEA reports before computing state totals. The reporting of fiscal data a year after the school year permits state administrative agencies to obtain audited fiscal LEA data.

Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States

This report represents the compiled data for one content area (mathematics) of the *National Assessment of Educational Progress*. The compendium contains hundreds of tables and charts documenting the responses of public and private school 4th, 8th, and 12th graders to the mathematics section of the NAEP. The 1992 assessment included nearly 250,000 students attending approximately 10,000 schools across the nations and states. Although the objectives framework underlying the assessments was developed by the Council of Chief State School Officers, participation and review were provided by educators, policymakers, practitioners, and citizens at large. The mathematics objectives were designed as a matrix comprising five broad content areas and three levels of mathematical ability. The content areas are: numbers and operations; measurement; geometry; data analysis, statistics and probability; and algebra and functions. The ability levels are: conceptual understanding; procedural knowledge; and problem solving. Student responses are broken down by geographical region, state, gender, race, and family background. Descriptive data are also provided from both students and teachers.

Degrees in Science and Mathematics: National Trends and State-by-State Data

This publication provides comprehensive national, regional, and state data on the number of degrees earned from mathematics and science programs in higher education and the related labor force, employment, and salary outcomes. Graduation statistics are presented for all degree levels in the fields of science and mathematics, and comparative data are included for other academic fields. For most indicators, year-by-year statistics document trends during the period from 1975 to 1990, and employment projections to the year 2005 are also included. Separate data for the number of degrees earned by non-U.S. citizens in mathematics, the sciences, and other fields are also provided.

Most of the data for this report draw upon the results of the "Higher Education General Information Survey," "Integrated Postsecondary Education Data System," "Recent College Graduate Survey," and "High School Transcript Study" programs of the National Center For Education Statistics (NCES).

Detailed Characteristics of Private Schools and Staff: 1987-1988

Produced in 1991, this report presents a detailed national summary of private schools and private school teachers and administrators. Information given for schools includes program emphasis, admissions criteria, and graduation and college application rates. Reported characteristics for teachers and administrators include personal background, educational level, experience, salary and incentives, nonschool employment, and attitudes and opinions about teaching. For every table, statistics are given for the nation as a whole as well as for public and private schools. Private school data are broken down according to various groupings — religious, nonsectarian, school affiliation, National Association of Independent Schools membership, and a nine-category private school typology. All data are based upon information collected through the 1987-88 Schools and Staffing Survey (SASS), developed by the National Center for Education Statistics and conducted by the U.S. Bureau of the Census. The SASS was a mail survey which collected public and private sector data on the nation's elementary and secondary teaching force, aspects of teacher supply and demand, teacher workplace conditions, characteristics of school administrators, and school policies and practices.

Digest of Education Statistics

Published annually since 1962, with the exception of the biennial editions of 1977-78, 1983-84, and 1985-86, the *Digest of Education Statistics* provides comprehensive national and state statistics for all levels of American public and private education. Using both government and private sources, with particular emphasis upon surveys and projects conducted by the National Center for Education Statistics (NCES), the publication reports on the number of education institutions, teachers, enrollments, and graduates; educational attainment; finances; government funding; and outcomes of education. Some international data are included in the 1993 edition. Background information on population trends, attitudes on education, education characteristics of the labor force, government finances, and economic trends is also presented. Some data included in the 432 tables and 34 figures of the *Digest* reflect historical trends and projections, covering the period between 1869 and 2004.

IAEP/NAEP Cross-Linking Study

This study, described in the 1993 report, *Toward World-Class Standards: A Research Study Linking International and National Assessments*, explains the process used by Educational Testing Service (ETS) to compare data across two separate mathematics assessments — the 1991 International Assessment of Educational Progress (IAEP) and the 1992 National Assessment of Educational Progress (NAEP). The primary focus of the study was to estimate the percentage of students from the IAEP countries predicted to fall above the three achievement levels established by the National Assessment Governing Board. Data from U.S. students who participated in both assessments were analyzed and modeled by way of a regression analysis. This model was then used to project IAEP results from non-U.S. countries onto the NAEP scale. Understanding the margin of error often associated with such comparisons, the study evaluates four possible sources of error by analyzing 1) the absolute relationship between the IAEP and NAEP assessments, 2) results for the entire IAEP population, 3) simple random samples of students, and 4) the true proficiency level of every student. The results of the study showed a strong correlation between the two assessments. The uncertainty of estimating population values based on a non-simple random sample proved to be the greatest component of error in linking the two mathematics assessments.

Integrated Postsecondary Education Data System

The Integrated Postsecondary Education Data System (IPEDS) surveys all postsecondary institutions, including universities and colleges, as well as institutions offering technical and vocational education beyond the high school level. This survey, which began in 1986, replaces the Higher Education General Information Survey (HEGIS).

IPEDS consists of several integrated components that obtain information on where postsecondary education is available (institutions), who participates in it and completes it (students), what programs are offered and what programs are completed, and what human and financial resources are involved in the provision of institutionally-based postsecondary education. Specifically, these components include: institutional characteristics, including institutional activity; fall enrollment, including age and residence; fall enrollment in occupationally specific programs; completions; finance; staff; salaries of full-time instructional faculty; and academic libraries.

Fall Enrollment. This survey has been part of the IPEDS (or HEGIS, the predecessor to the IPEDS) series since 1966; it was redesigned in the fall of 1986 with the introduction of IPEDS. The new survey system comprises all postsecondary institutions, but also maintains comparability with earlier surveys by allowing HEGIS institutions to be tabulated separately.

The 1991 enrollment response rate was 86.6 percent. Classification problems, the unavailability of needed data, interpretation of definitions, the survey due date, and operational errors have traditionally been major sources of nonsampling error for this survey. Of these, it is estimated that the classification of students has been the main cause of error.

Completions. This survey has been part of HEGIS (the predecessor to the IPEDS) since its inception. The response rate for the 1989–90 survey was 92.3 percent. The major sources of nonsampling error for this survey were differences between the NCES program taxonomy and taxonomies used by the colleges, classification of double majors and double degrees, operational problems, and survey timing.

Institutional Characteristics. This survey provided the basis for the universe of institutions presented in the Education Directory, Colleges and Universities. The universe comprised institutions that met certain accreditation criteria and offered at least a 1-year program of college-level studies leading toward a degree. All of these institutions were certified as eligible by the U.S. Department of Education's Division of Eligibility and Agency Evaluation. Each fall, institutions listed in the previous year's Directory were asked to update a computer printout of their information.

Financial Statistics. This survey was part of the HEGIS series and has been continued under the IPEDS system. Changes were made in the financial survey instruments in fiscal years (FY) 1976, 1982, and 1987. Beginning in FY 82, Pell Grant data were collected in the categories of federal restricted grants and contracts revenues and restricted scholarships and fellowships expenditures. The introduction of IPEDS in the FY 87 survey included several important changes to the survey instrument and data processing procedures. While these changes were significant, considerable effort has been made to present only comparable information on trends in this report and to note inconsistencies.

The response rate has been about 85 to 90 percent for most of the years reported. The FY91 response rate was 86.7 percent. Possible sources of nonsampling error in the financial statistics include nonresponse, imputation, and misclassification.

Staff. The fall staff data presented in this publication were collected in cooperation with the U.S. Equal Employment Opportunity Commission (EEOC). In 1989, survey instruments were mailed to 6,669 in-scope postsecondary education institutions, including 2,576 4-year schools, 2,739 2-year schools, and 273 public less-than-2-year schools. EEOC collects staff data through the Higher Education Staff Information (EEO-6) report from all higher education institutions with 15 or more full-time employees. NCES, through the IPEDS system, collects data from all other postsecondary institutions, including higher education institutions with less than 15 full-time employees. The NCES and EEOC collect staff data biennially in odd numbered years in institutions of postsecondary education. The IPEDS file combines data from the two surveys to create the IPEDS "Fall Staff" data tape.

The overall response rate for the "Fall Staff" survey was 77.4 percent. The response rate for higher education institutions was 89.6 percent.

International Assessment of Educational Progress

(See earlier entry under *Educational Testing Service*)

NAEP 1992 Mathematics Report Card for the Nation and the States

This extensive report contains tables and narrative descriptions outlining student performance results on the 1992 National Assessment of Educational Progress (NAEP) mathematics assessment, the history of NAEP, and how the assessment was conducted. Overall performance results of students are presented, broken down by geographic region, demographic subpopulation (including race/ethnicity and gender), grade level (4, 8, or 12), and achievement level. Parallel break-downs are presented for each of the five NAEP mathematics content areas (numbers and operations; measurement; geometry; data analysis, statistics, and probability; and algebra). The appendices include information about the contextual background of NAEP student participants and a detailed procedural overview of the assessment. (For more information about the NAEP assessments, see description of *Data Compendium for the NAEP 1992 Mathematics Assessment of the Nation and the States*.)

National Assessment of Educational Progress

The National Assessment of Educational Progress (NAEP) is a Congressionally mandated study funded by the Office of Educational Research and Improvement, U.S. Department of Education. The overall goal of the project is to determine the nation's progress in education. To accomplish this goal, a cross-sectional study was designed and initially implemented in 1969. Periodically, NAEP has gathered information about levels of educational achievement across the country. NAEP has surveyed the educational accomplishments of 9-,13-, and 17-year-old students (and in recent years, grades 4, 8, and 12), and occasionally young adults, in 10 learning areas. Different learning areas were assessed annually and, as of 1980–81, biennially. Most areas have been periodically reassessed in order to measure possible changes in education achievement.

Overview and Inventory of State Requirements for School Coursework and Attendance

Produced in 1992 as part of NCES' Research and Development (R&D) series, this report outlines: state mandates affecting student standards; the evolving role of the states in the school reform process; trends in related student performance outcomes; and the role that federal agencies such as NCES can assume in monitoring the impact of state school reform efforts. This overview is a response to the 1988 Hawkins-Stafford Elementary and Secondary School Improvement Amendments, which included a mandate for an evaluation of "the effects of higher standards prompted by school reform efforts on student enrollment and persistence." Twenty-five tables and figures supplement text reporting on such targets of reform as high school graduation requirements, competency testing, minimum grade-point averages, instructional time and intensity, and state-standardized curriculum.

Private School Universe Survey, 1989-90

This report, conducted in 1989-90 by the U.S. Bureau of the Census for the National Center for Education Statistics (NCES), presents data on private schools in the 50 states and the District of Columbia for grades kindergarten through twelve by school size, school level, religious orientation, geographical region, and program emphasis. The numbers of students and teachers are reported in these same categories, as well as by grade level. As a key component of the Private School Data Collection System, the Private School Universe Survey (PSS) is a system designed to: 1) build an accurate and complete NCES universe frame of private schools to serve as a sampling frame for NCES sample surveys of private schools; and 2) generate annual data on the total number of private schools, teachers, and students.

The 1989 PSS area frame sample consists of 123 primary sampling units (PSUs). Each PSU is composed of a single county or independent city or cluster of geographically-contiguous areas defined so that each PSU has a minimum population of 20,000 according to the 1988 projected population. An attempt was made to locate and survey all eligible private schools within each PSU.

Private Schools in the United States: A Statistical Profile, With Comparisons to Public Schools

Drawing only on previously published or previously tabulated data, this report provides an overview of basic private school data for the school years 1980-1981 through 1985-1986. Comparative data also is given for public schools when available. The 70 tables present data on enrollment, number of schools, tuition costs, governance, staffing characteristics, and student attitudes and behavior by control of institution, religious orientation, level, grade, geographical region, race and gender. Information is based on the following surveys conducted by NCES: The Private School Survey, 1980-81; The Private School Survey for 1983-84; The Private School Survey for 1985-86; The 1985 Public School Survey; Common Core of Data; and High School and Beyond.

Schools and Staffing Survey

Information on the school work force and teacher supply and demand are fundamental features of America's public and private school landscape. Yet, until recently, there has been a lack of data on characteristics of our children's teachers and administrators and their workplace conditions. The Schools and Staffing Survey (SASS) was designed to meet this need. This survey is a comprehensive public and private, elementary and secondary education database that combines and expands three separate surveys NCES has conducted in the past, including surveys of teacher demand and shortage, of public and private schools, and of public and private school teachers.

Schools are the primary sampling unit for SASS, and a sample of teachers is selected in each school; public school districts are included in the sample when one or more of their schools is selected. The 1990-91 SASS included approximately 12,800 schools (9,300 public and 3,500 private), 65,000 teachers (52,000 public and 13,000 private), and 5,600 public school districts. The survey was conducted by mail, with telephone follow-ups.

The SASS sample has been designed to support the following types of estimates and comparisons: national and state estimates for public schools and teachers; estimates for private schools and teachers at the national level and for selected orientation groupings; and national comparisons of elementary, secondary, and combined schools and teachers. SASS was first conducted in the 1987–1988 school year. Data collection at two-year intervals began in 1990–91.

National Center for Health Statistics
U.S. Department of Health and Human Services

Vital Statistics of the United States

Vital Statistics of the United States is an annual compilation of data pertaining to natality and mortality for the U.S. and its territories. Each two-volume edition presents tables with breakdowns by geographic region (for the nation, states, and various counties), age, race, and gender. All data are collected by the National Center for Health Statistics using birth and death registrations and reports of fetal deaths. Mortality statistics are based on records from each reported year, with the exception of 1972, when a 50 percent sample was used due to personnel and budgetary restrictions.

National Science Foundation
National Science Board

Science and Engineering Indicators

In response to Sec.4(j)(i) of the National Science Foundation Act of 1950, the National Science Board (NSB) has published this biennial report on national and international science and engineering indicators. As a division of the National Science Foundation, a Federal agency, the NSB produces this report primarily as a reference for researchers and policymakers. Providing text, tables, and charts, *Science and Engineering Indicators* reports upon the global status of the United States in science, math, and engineering education; participation of scientists and engineers in the labor force; research and development; technological innovation; and public attitudes toward science and technology. Most of the international tables compare the United States to the other G-7 nations or members of the Organization for Economic Co-operation and Development (OECD).

Organization for Economic Co-operation and Development

(See also earlier entry under *Center for Educational Research and Innovation*)

Education at a Glance

The Organization for Economic Co-operation and Development (OECD), which had for years published indicators on macroeconomics, trade, industry, and agriculture, began an effort in the 1980s to develop and collect social indicators, starting with health care. Turning its attention next to education, the organization launched, in 1987, the Indicators of Education Systems project (INES) under the responsibility of its Center for Educational Research and Innovation (CERI). Several international groups of experts developed conceptual frameworks, agreed on definitions, and executed pilot studies to determine the set of possible indicators that best illustrated the condition of education in the OECD countries. In 1992, the OECD published a set of indicators, employing data from the late 1980s, in *Education at a Glance* (EAG).

The 1993 version presents an improved and updated set of international education indicators which cover the 1990/91 school year. The 38 indicators excluded are the product of extensive co-operation among the Member countries and the OECD Secretariat and, in particular, intense work by the data producers involved in the INES (Indicators of Education Systems) project.

All countries have contributed resources to the project, and some have provided substantial additional assistance through their support to the Technical Group, four Networks and several *ad hoc* investigative teams. The publication of this study has been facilitated by a special grant made available to INES by the National Center for Education Statistics (NCES) at the United States Department of Education.

This publication, like its predecessor, has four principal sections: one devoted to the economic, social and demographic context of education (C); the second presenting information on costs, resources and processes (P); a third dedicated to the results of education (R); and a fourth including notes to the indicators, technical comments and a glossary. To these four sections has been added a fifth, a statistical supplement containing the most complex tables, which have been moved to the end in order to trim the main body of the volume. Each section is accompanied by a brief introduction that draws the attention of the readers to important issues of measurement and interpretation.

Education in OECD Countries: A Compendium of Statistical Information

A predecessor to the *Education at a Glance* series, the *Compendium* series ended with the publication of 1989/90 data. Content of the *Compendium* was short on text and long on tables and graphs. *Compendium* volumes contained many of the same tables included later in *Education at a Glance volumes* — for enrollment, attainment, and education spending, for example — but without any descriptive or explanatory text. Unique to the *Compendium* series, however, is a section of one-page diagrams describing the structure of each country's education system. Each diagram indicates the duration typical to each type and level of education and the direction of student flows between types and levels.

Statistical Office of the European Communities

Demographic Statistics

Published annually, *Demographic Statistics* is a statistical yearbook presenting data on population, natality, mortality, and civil status for the European Community and its 12 member states. Comparisons are also made between the European Community and the world. Although most of the almost 200 tables and graphs provide current data, both historical trends and projections are documented in some figures for the period between 1960 and 2020.

For member states of the European Community, information is provided by national statistical services. Data for non-community countries are gathered primarily from international organizations, mainly the United Nations. In certain cases, intercountry data are not strictly comparable due to varying definitions and classifications of some categories. Such discrepancy is modified in this publication using SYSCODEM, a software system which employs a common method to calculate demographic measures.

United Nations Educational, Scientific, and Cultural Organization (UNESCO)

Statistical Yearbook, 1992

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) conducts annual surveys of education statistics of its member countries. Besides official surveys, data are supplemented by information obtained by UNESCO through other publications and sources. Each year more than 200 countries reply to the UNESCO surveys. In some cases, estimates are made by UNESCO for particular items such as world and continent totals. While great efforts are made to make them as comparable as possible, the data still reflect the vast differences among the countries of the world in the structure of education. While there is some agreement about the reporting of first- and second-level data, the third level (postsecondary education) presents numerous substantial problems. Some countries report only university enrollment while other countries report all postsecondary, including vocational and technical schools and correspondence programs. A very high proportion of some countries' third-level students attend institutions in other countries. While definition problems are many in this sort of study, other survey problems should not be overlooked. The member countries that provide data to UNESCO are responsible for their validity. Thus, data for particular countries are subject to nonsampling error and perhaps sampling error as well. Some countries may furnish only rough estimates while data from other countries may be very accurate. Other difficulties are caused by the varying periodicity of data collection among the countries of the world. In spite of such problems, many researchers use UNESCO data because they are the best available. Users should examine footnotes carefully to recognize some of the data limitations.

United States Department of Commerce

(See earlier entries under *Bureau of the Census* and *Bureau of Economic Analysis*)

United States Department of Education

(See earlier entry under *National Center for Education Statistics*)

United States Department of Health and Human Services

(See earlier entry under *National Center for Health Statistics*)

United States Department of Labor

(See earlier entry under *Bureau of Labor Statistics*)

United States General Accounting Office

Education Finance: Extent of Federal Funding in State Education Agencies

The U.S. General Accounting Office (GAO) is an agency of the U.S. Congress, primarily responsible for audits and evaluations of federal programs. The GAO also responds to requests from members of Congress for information that will facilitate sound judgement and prudent decisions on pending legislation. Sometimes, responding to these requests requires original data collection in a domain outside the boundaries of preexisting official data collection activities. *Education Finance* represents such a response to a Congressional request. It is a compilation, in considerable detail, of each state education agency's total expenditures for administration and the proportion of those expenditures represented by federal revenue.

World Health Organization

World Health Statistics Annual

The World Health Organization (WHO), a division of the United Nations devoted to the research, evaluation, and dissemination of services concerning issues of international public health, has published the *World Health Statistics Annual* since 1962. From 1939 to 1962, the report was produced under the title *Annual Epidemiological and Vital Statistics*. Based on data provided by the national statistical offices of individual countries, the publication reports upon the global prevalence of diseases and disablements; causes of death; immunizations; population and urbanization trends and projections; and life expectancy. Tables and figures are broken down by WHO region, country, age and gender. The 1990 report contains data for fifty nations in WHO regions of Europe, the Americas, South-East Asia, the Eastern Mediterranean, and the Western Pacific. The countries included in the report vary year to year, due to inconsistent participation of individual nations.

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